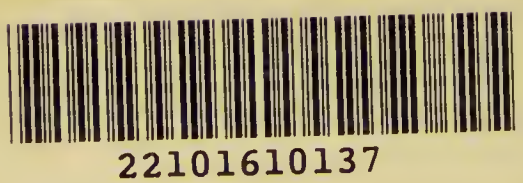
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OUTLINES

OF

MEDICAL TREATMENT.

BY

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PHYSICIAN TO THE LONDON HOSPITAL;

AND

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MEDICAL TUTOR TO THE LONDON HOSPITAL.

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PREFACE TO THE FOURTH EDITION.

In the present edition the whole work has been carefully revised, and such additions made to it as the progress of Medical Treatment during the past two years has rendered necessary.

In view of the yearly increasing importance of electricity in the diagnosis and treatment of disease, it has occurred to the Authors that a more detailed account of its mode of application and therapeutic value might prove of use. A special chapter (Chapter XIV) has therefore been inserted, from the pen of Dr. H. Lewis Jones, Medical Officer in charge of the Electrical Department at St. Bartholomew's Hospital, to whom the Authors would embrace this opportunity of expressing their sincere obligations.

29, Harley Street;
February 23rd, 1894.

PREFACE TO THE THIRD EDITION.

It has been found impossible to take notice of the various improvements that have been effected in the treatment of disease since the publication of the last edition without adding considerably to the size of the volume. It must, however, be observed that the principles of treatment, as enunciated in the previous editions, have undergone but slight modifications, whilst the general plan of the work itself has remained unchanged.

It has been thought advisable to supplement the treatment of each disease by a description of the methods employed by practitioners of other countries, and, with this object, a short account of the treatment adopted in America, France, and Germany has been appended in smaller type at the end of each section. In addition to numerous monographs, the authors of the articles in 'Pepper's System of Medicine' have been selected as representing American opinion; the quotations from the French are mainly from the 'Traité de Pathologie interne' of Jaccoud; and those of the German from 'Ziemssen's Cyclopædia of the Practice of Medicine,' 'Strümpell's Text-book of Medicine,' 'Die Therapie an den Wiener Kliniken,' and other works of a similar character.

The list of prescriptions at the end of the volume has been revised and considerably enlarged, whilst Chapter XVIII, on "Diet and Regimen in Chronic Diseases," has been added, with the hope of assisting the practitioner in the management of those cases whose well-being depends on the efficiency of their hygienic surroundings rather than upon medicinal treatment.

29, Harley Street,
Cavendish Square;
June 1*st*, 1891.

PREFACE TO THE FIRST EDITION.

When recently occupying the Chair of Medicine at the London Hospital Medical College it was my custom to devote the last few lectures of each session to a short outline of the treatment of the various diseases which had been described during the course. I found that by so doing I was the better enabled to aid the thoughtful student in preparing for his examinations, and also that the plan served to call to the minds of the class what had been taught them in the wards of the hospital and in the out-patient clinique. On relinquishing the chair it was suggested to me that the publication of these lectures might perhaps prove useful, and acting on this I have put together the notes from which they were delivered, whilst retaining, as far as possible, the arrangement and conversational style of the original lectures.

Such general rules as are applicable to the treatment of disease in all its forms, and which must therefore be ever borne in mind, are briefly laid down in the first chapter, and reference to them is afterwards rendered easy by a lettered arrangement throughout the book.

Believing that similar pathological conditions, although in diverse organs, present similar indications for treatment, I have in the second chapter shortly delineated such indications as present themselves in the acute forms of disease; whilst in the third chapter are described those arising from pathological changes of a chronic nature, and in the chapters that deal with separate diseases the remarks as to their treatment are preceded by a reference to the pages in which these indications are to be found.

On many occasions I have been forcibly reminded of one great advantage of the old apprenticeship system, which has somewhat suffered by the change in medical education of recent

years. Formerly, when students had served an apprenticeship before entering upon their hospital career, each one was practically acquainted with the actions and doses of the drugs in common use, even when ignorant of all beside. Now we meet with many who can describe the course and symptoms of a disease, but who are entirely unacquainted with the remedies employed in its treatment. I need scarcely remark how needful it is that every senior student should not only know his remedies by heart, but that he ought to be so perfectly familiar with their doses and ordinary combinations that he may be able to write his prescriptions with ease and confidence; and with the view of assisting him in this, I have added a number of formulæ which I would advise him to practise himself in copying. They are simple in character, and are selected from Mr. Squire's valuable collection of the pharmacopœias of the metropolitan hospitals, from the works of Dr. Tanner, Mr. Beasley, and other authors. The arrangement of remedies is that proposed by Dr. Wood.

Notwithstanding that, in all our larger hospitals, the most improved methods for the administration of remedies are in constant use, I have thought that a few hints on this subject might not prove unacceptable to those senior students who have the management of dispensaries and cottage hospitals, and for this purpose a few drawings are inserted.

In conclusion, I must remind my readers that this volume is not intended as a substitute for the more elaborate treatises on medicine. It is only an outline, which must be filled in with the student's own observation and experience. If, however, it should tend to make him more careful and painstaking in the treatment of his cases; if it should make his views more clear as to what he can and what he cannot effect by medicine; if it teach him when actively to interfere, and when to be content with the mere relief of symptoms,—the purpose of its publication will have been fully answered.

29, Harley Street,
Cavendish Square;
September 5th, 1879.

CONTENTS.

CHAPTER I.

PAGE

Erroneous views respecting therapeutics.—First general rule in the treatment of disease is to remove the exciting cause.—Second general rule is to watch the condition of the heart in all acute diseases.—The state of the circulation varies in the same disease at different times.—Third general rule is to watch the state of the nervous system in all acute diseases.—Fourth rule is to give rest in all acute diseases.—Fifth rule is that in all acute febrile maladies the diet should consist of liquid food.—Sixth rule is that in all chronic affections attention must be directed to the organs engaged in nutrition.—Medicines require time to enable them to act . . . 1—15

CHAPTER II.

The same pathological change requires similar treatment whenever it may occur.—Indications for the treatment of acute inflammation.—Indications for the treatment of hæmorrhage.—Indications for treatment during an attack of spasm or neuralgia . . . . . 16—29

CHAPTER III.

Indications for the treatment of chronic local diseases.—Indications for the treatment of chronic inflammation.—Indications for the treatment of dropsy.—Indications for the treatment of dilated organs.—Indications for the prevention of spasm or neuralgia . . . . . 30—38

CHAPTER IV.

PAGE

Diseases of the heart and pericardium.—Cardiac stimulants.—Uses of alcohol.—Cardiac tonics.—Uses of digitalis, strophanthus, and convallaria.—Cardiac depressants.—Venesection.—Antimony. — Aconite. — Veratrum viride. — Palpitation. — Treatment during an attack.—Prevention of palpitation.—Fainting.—Gradual failure of the heart's power.—Causes of cardiac failure.—Treatment of asthenia.—Pain in the cardiac region.—Angina pectoris—Treatment during an attack.—Amyl nitrite. — Morphia. — Prevention of angina. — Nitroglycerine.—Acute pericarditis.—Pericardial effusion.—Paracentesis pericardii.—Endocarditis.—Embolism.—Ulcerative endocarditis.—Hypertrophy of the heart.—Sedatives.—Dilatation of the heart.—Hæmoptysis.—Use of iron.—Dyspnœa from cardiac failure.—Acute congestion of the lungs.—Use of digitalis and mercury.—Value of venesection.—Treatment of cardiac insomnia.—Cardiac dropsy.—Value of diuretics.—Albuminuria.—Punctures in œdematous tissue.—Valvular disease.—Relative significance of cardiac murmurs.—Aneurism of the aorta.—Value of iodide of potassium . . . 39—69

CHAPTER V.

Diseases of the larynx.—Forms of inhalers.—Nebulizers.—Inhalations.—Laryngeal brush.—Galvanisation of the larynx.—Laryngismus stridulus.—Treatment during an attack.—Prevention of attacks.—Paralysis of vocal cords.—Acute laryngitis.—Use of emetics in children.—Acute œdema of the glottis.—Scarification of epiglottis.—Croup.—Tracheotomy.—The steam tent.—Removal of the false membrane.—Chronic laryngitis. — Local treatment by astringents. — Tubercular laryngitis . . . . . 70—85

CHAPTER VI.

Diseases of the lungs.—Importance of the diaphragm in respiration. — Use of condensed air. — Waldenburg's apparatus. — Depressant expectorants.—Stimulant expectorants.—Alkalics in chronic bronchitis.—Sedatives in cough.—Cyanosis.—Dyspnœa.—Cough.—Pains in the chest.—Asthma.—Treatment

PAGE

during an attack.—Value of stramonium and atropine.—Prevention of asthma.—Hay asthma.—Use of cocaine.—Pleurisy.—Use of local applications.—Use of strapping.—Value of blisters and mercurial ointment.—Indications for paracentesis.—Contra-indications.—Empyema.—Pneumothorax.—Aspiration.—Acute bronchitis.—Capillary bronchitis.—Acute pneumonia.—Rules for venesection.—Reduction of temperature.—Local applications.—The ice-bag.—Asthenic pneumonia.—Gangrene of the lung.—Broncho-pneumonia.—Opium contra-indicated.—Value of emetics.—Hydrothorax.—Chronic bronchitis.—Plastic bronchitis.—Fetid bronchitis.—Influence of employment and climate.—Indications afforded by character of the expectoration.—Emphysema.—Phthisis pulmonum.—Diet.—Cod-liver oil.—Maltine.—Value of tonics.—Use of arsenic.—Treatment of cough.—Hæmoptysis.—Perchloride of iron spray. –Chronic hæmoptysis.—Profuse perspirations 86—131

CHAPTER VII.

Diseases of the mouth and throat.—The tongue as an indication of disease.—Thrush.—Oral catarrh.—Aphthæ.—Ulcerative stomatitis.—Noma.—Employment of caustics.—Salivation.—Catarrh of pharynx.—Chronic pharyngitis.—Tonsillitis.—Value of salicylate of soda and antipyrin.—Suppuration.—Retro-pharyngeal abscess.—Inflammation of œsophagus.—Stricture of œsophagus.—Spasmodic stricture . 132—145

CHAPTER VIII.

Diseases of the stomach.—Nutritive enemata.—Aperient enemata.—Relative digestibility of various foods.—Gastric stimulants.—Value of bitters.—Gastric sedatives.—Digestives.—The use of the stomach-pump.—Stomach syphon.—Reservoir pump.—Acidity.—Use of alkalies and special diet.—Flatulence.—Value of acids.—Water-brash.—Causes of vomiting.—Nervous vomiting.—Hysterical vomiting.—Vomiting from fermentation.—Vomiting in gastric catarrh.—Causes of hæmatemesis.—Its treatment.—Hiccough.—Gastralgia.—Acute gastritis.—Gastric ulcer.—Use of sedatives and strict diet.—Dyspepsia.—Chronic gastric catarrh.—Bismuth.—Atonic dys-

PAGE

pepsia. — Its causes. — Tonics. — Cancer of the stomach. — Morphia.—Dilatation of the Stomach.—Value of the stomach-pump. — Diet. — Fermentation of the food. — Vomiting. — Emaciation.—Constipation.—Operations on the pylorus 146—176

CHAPTER IX.

Diseases of intestines.—Influence of various kinds of food upon peristalsis.—Varieties of purgatives.—Laxatives.—Drastics. —Hydragogue purgatives.—Enemata.—Causes of diarrhœa. —Acute diarrhœa.—Value of chalk.—Bilious diarrhœa.— Chronic diarrhœa.—Chronic constipation.—Use of purgatives in treatment of constipation.—Neuralgia of intestines.— Causes of colic.—Treatment during an attack.—Prevention of colic.—Intestinal hæmorrhage.—Acute intestinal catarrh. —Typhlitis.—Causes of intestinal obstruction.—Its diagnosis and prognosis.—Treatment of obstruction.—Use of opium.— Operative treatment for intestinal obstruction.—Chronic intestinal catarrh. — Animal parasites.— Tapeworms.— Round-worms.—Threadworms . . . . . 177—208

CHAPTER X.

Diseases of the peritoneum.—Acute peritonitis.—Local peritonitis. —Perforation of the appendix.—Diagrams illustrating its diagnosis.—Administration of opium.—Chronic general peritonitis.—Tubercular peritonitis.—Carcinoma of the peritoneum . . . . . 209—216

CHAPTER XI.

Diseases of the liver.—Cholagogues.—Acid baths in hepatic congestion.—Causes and prognosis of jaundice.—Its treatment. —Hepatic neuralgia.—Acute yellow atrophy.—Abscess of liver.—Its prognosis and treatment.—Surgical treatment of. —Diagrams showing sites for puncture in hepatic abscess.— Hepatic congestion.—Mineral waters.—Cirrhosis of the liver. —Perihepatitis.—Value of mercury in cirrhosis.—Hydatid cysts of liver.—Their treatment.—Cancer of liver.—Fatty liver.—Lardaceous disease of liver.—Gall-stones.—Treatment during an attack of biliary colic.—Prevention of gall-stones. —Use of phosphate of sodium and mineral waters . 217—244

CHAPTER XII.

PAGE

Diseases of the kidneys.—Warm and vapour baths.—Diuretics.—Functional diseases of the kidneys.—Anuria.—Uræmia.—Its symptoms and prognosis.—Use of venesection.—Uræmic convulsions.—Frerichs' theory.—Uræmic inflammation of serous membranes.—Uræmic vomiting.—Renal dropsy.—Use of pilocarpine and purgatives.—Dangers of operative procedures.—Anæmia in kidney disease.—Hæmaturia.—Chyluria.—Acute nephritis.—Its prognosis and treatment.—Pyelonephritis.—Acute pyelitis.—Chronic Bright's disease.—Secondary inflammations.—Pyonephrosis.—Chronic pyelitis.—Hydronephrosis.—Cancer of the kidney.—Renal calculi.—Prevention of renal calculi.—Treatment of renal colic . . . 245—273

CHAPTER XIII.

Diseases of the brain.—Cautions respecting restraint in cases of delirium.—Treatment of cerebral excitement.—Nervine stimulants.—Excito-motors.—Sedatives.—Nervine tonics . 274—277

CHAPTER XIV.

Electricity in the treatment of disease.—Batteries and apparatus.—The induction coil.—Physiological considerations.—Utilisation of electric lighting currents.—Resistance of the body.—Electrolytic effects.—Phenomena of nerve and muscle.—Methods of testing muscles.—General methods of application of electricity in disease.—Hemiplegia.—Infantile paralysis.—Injuries to nerves.—Neuritis.—Lead poisoning.—Neuralgia.—Hysteria and Neurasthenia.—Insomnia.—Other diseases.—Tinnitus aurium.—Raynaud's disease.—Exophthalmic goitre.—Incontinence of urine . . . . 278—310

CHAPTER XV.

Diseases of brain.—Delirium.—Its causes and differential diagnosis.—Delirium tremens.—Its treatment.—Convulsions—Its causes, differential diagnosis, and treatment.—Convulsions in children.—Hysterical convulsions.—Neuralgia.—Sedatives

PAGE

in neuralgia.—Prevention of neuralgia.—Pains in the head.—Neuralgic headache.—Rheumatism of the scalp.—Syphilitic periostitis of the skull.—Dyspeptic headache.—Bilious headache.—Neuralgia of the face.—Sciatica.—Paralysis, its prognosis and treatment.—Congestion of the brain.—Local treatment.—Simple meningitis.—Tubercular meningitis.—Apoplexy.—Prognosis and treatment.—Rules for venesection in cerebral hæmorrhage.—Cerebral thrombosis.—Cerebral embolism.—Cerebritis.—Cerebral abscess.—Cerebral anæmia.—Nervous exhaustion.—Softening of the brain.—Multiple sclerosis of brain.—Cerebral tumours.—Differential diagnosis and treatment.—Chronic hydrocephalus.—Chorea.—Sedatives in chorea.—Use of tonics.—Epilepsy.—Sedatives in the treatment of epilepsy.—Hydrophobia.—Pasteur's treatment.—Tetanus.—Exophthalmic goitre.—Use of the ice-bag and galvanism in Graves' disease.—Hysteria.—The Weir-Mitchell treatment.—Catalepsy . . . . 311—360

CHAPTER XVI.

Diseases of the spinal cord.—Congestion and hæmorrhage.—Spinal meningitis.—Acute myelitis.—Chronic spinal meningitis.—Chronic myelitis.—Multiple neuritis.—Tabes dorsalis.—Spastic paraplegia.—Infantile paralysis.—Progressive muscular atrophy.—Paralysis agitans.—Writer's cramp.—Metallic tremors . . . . . 361—373

CHAPTER XVII.

Fevers.—Symptoms and pathology of fever.—Febrifuge medicines.—Salicylic acid.—Quinine.—Digitalis.—Antifebrin.—Antipyrin.—Phenacetin.—Reduction of temperature by direct abstraction of heat.—Method of sponging.—The application of the wet pack.—Continuous application of cloths wet with ice-cold water.—The cold bath.—Contra-indications to the bath.—Ziemssen's bath.—The ice-cradle.—Its advantages and disadvantages.—Diagram illustrating the effect of the ice-cradle upon the temperature in typhoid and acute pneumonia.—Infectious fevers.—Their general treatment.—General hygienic rules for the treatment of infectious dis-

PAGE

orders.—Bedsores, their prevention and treatment.—Cystitis in fever.—Measles and its complications.—Rötheln.—Scarlatina.—Scarlatinal nephritis.—Smallpox.—The prevention of "pitting."—Enteric fever and its complications.—Diet in typhoid.—Treatment of hæmorrhage and perforation.—Typhus.—Relapsing fever.—Erysipelas.—Diphtheria.—The administration of iron.—Local treatment in diphtheria.—Pyæmia.—Acute tuberculosis.—Parotitis.—Influenza.—Hooping-cough.—Sedatives in hooping-cough.—Cerebro-spinal fever.—Dysentery.—Value of ipecacuanha.—Asiatic cholera.—Transfusion.—Acute rheumatism.—Alkaline and salicylate treatment.—Gonorrhœal rheumatism . 374—425

CHAPTER XVIII.

Malarial fever.—Value of quinine and arsenic.—Syphilis.—Methods of administering mercury.—Value of iodides.—Gout.—Irregular gout.—Acute gout.—Use of colchicum.—Chronic gout.—Diet in gout.—Scurvy.—Chlorosis.—Pernicious anæmia.—Causes of anæmia . . . . 426—440

CHAPTER XIX.

Rheumatoid arthritis.—Diet.—Rickets.—Purpura, its causes and treatment.—Leucocythæmia.—Hodgkin's disease.—Addison's disease.—Diabetes mellitus.—Glycosuria in old people.—Diet in diabetes.—Diabetes insipidus.—Myxœdema.—Extract of thyroid gland . . . . . 441—452

CHAPTER XX.

Diet and regimen in chronic diseases.—Chronic heart disease.—Chronic bronchitis and phthisis.—Choice of climates.—Atonic dyspepsia.—Dyspepsia attended with excessive flatulence.—Dyspepsia attended with great acidity.—Chronic constipation.—Chronic diarrhœa.—Obesity.—Use of mineral waters.—Chronic diseases of the liver.—Chronic kidney diseases.—Chronic gout . . . . . 453—468

FORMULÆ.

PAGE

Alteratives.—Antacids.—Anthelmintics.—Antiseptics.—Antispasmodics.—Astringents.—Cardiac sedatives.—Cardiac stimulants.—Cardiac tonics.—Diaphoretics.—Diuretics.—Excitomotors.—Depresso-motors.—Expectorants.—Purgatives.—Sedatives.—Tonics.—Gargles.—Lozenges.—Applications for the throat.—Spray inhalations.—For oral or naso-oral respirators.—Enemata.—Peptonised foods.—Foreign formulæ 469—487

OUTLINES OF MEDICAL TREATMENT.

CHAPTER I.

ON THE GENERAL TREATMENT OF DISEASE.

The treatment of a disease is much more difficult than its diagnosis. In diagnosis you have, for the most part, only to discover what is the state of the organ affected, and by attention to the symptoms and physical signs you may generally arrive at a correct conclusion. But you have to take into consideration the age, sex, condition, and the previous state of the health of the patient, and also whether other maladies co-exist, before you can determine on your line of treatment. Again, diseases vary greatly in severity at different times; and even in the same disease what may be useful at one period may be positively injurious at another. You will, therefore, understand that close and accurate observation is essential to the formation of a good practitioner, and that no amount of reading, however valuable this may be, can compensate for a want of clinical experience.

Most students commence their career with very erroneous ideas respecting the aim of therapeutics. They imagine that there are particular drugs that have power over certain diseases, and that it is only necessary to discover the complaint, and then a medicine proper for it may be readily found. Thus they regard bismuth as a specific for acute catarrh of the stomach, chalk for a similar condition of the intestines, and ammonia or the compound tincture of camphor as a remedy for all cases of bronchitis. They look, in fact, upon drugs as antidotes to the diseases for which they are administered. It is quite true that

there are some that prove, in most cases, beneficial in particular conditions of the system—such as mercury in syphilis, and quinine in ague; but that these medicines are not antidotes for such complaints is proved by the fact that syphilitic iritis may commence whilst a patient is under salivation, and ague may attack a person exhibiting the symptoms of cinchonism.

This idea is not, however, confined to students, but is shared by many who have been in practice for many years, and who are constantly hoping to discover drugs that have a special power over some particular disease. Let any one look over the pages of a medical periodical, and he will see how many medicines are daily lauded as being specifics for this or that complaint, and yet most of them are soon forgotten when further experience has demonstrated that their value had been exaggerated. The disappointment of the advocates of such remedies is not the only result of their mistakes, for many medicines are lost sight of because too much was at first expected from them. A little consideration will suffice to show that we are never likely to become acquainted with substances that will be capable of overcoming any particular disease under all circumstances.

In the first place, the same malady varies greatly in its course and severity at different times. Thus scarlatina, that was described by a great physician as being so trifling a complaint that it scarcely required treatment, presented itself some years afterwards as a most intractable and fatal disorder. Can any one suppose that the same remedy could be successfully employed under such different circumstances, or that patients who were so severely attacked that their strength was at once prostrated, could be treated in the same manner as those whose health had been scarcely injured by the epidemic? In the second place, the severity of a disease varies according to the age, health, and strength of the patient; and the same treatment that can be used for a healthy adult may be quite unfitted for one enfeebled by age or suffering from some organic mischief.

Another very general mistake is that the treatment of a complaint consists solely in the administration of drugs. The student looks upon a physician as ignorant or neglectful who does not introduce into his patient's system various vegetable or

mineral substances whenever he is called upon to prescribe for him. But, in reality, drugs are only a part of the treatment of disease, and are often inferior in value to rest, position, diet, and such like measures. Nay, sometimes they positively do mischief. Take, for example, a case of acute gastric catarrh. In many cases every drug that is prescribed acts only as an irritant to the inflamed stomach, and the vomiting does not subside until both drugs and food have been abandoned, and the organ has been left in a state of perfect rest.

The ideas of students are often very vague upon another point: they imagine that when a disease has ended in recovery it is in consequence of some remedy that has restored the injured part to its normal condition. The fact is that most cures are the result, not of the drugs administered, but of the reparative power that is inherent in every animal body. Why an injured part should be restored to its former condition we are no more able to explain than we can understand the mysterious processes of growth, secretion, and reproduction. But we know there is a power in every structure that tends to maintain its normal state, and to restore it, after being injured, to such a condition as will enable it again to discharge its functions.

This inherent power of repair in all animal bodies is the most important point in therapeutics, and yet it is one that is constantly overlooked. In the practice of surgery, so long as it was imagined that wounds were cured by the application of drugs and balsams, all improvements were supposed to consist in the invention of salves and ointments; but as soon as the great physiological truth was realised that an injury is healed by a natural process of repair these supposed remedies were abandoned, and the surgeon contented himself with maintaining the edges of a wound in contact, and leaving nature to perform the cure. In like manner, as soon as we fully recognise that the cure of an internal injury, however produced, can only be the result of a power of repair inherent in the tissues, we shall be able better to estimate the real value of many of the methods of treatment on which we are now in the habit of depending.

But you may ask, if the cure of an internal malady is merely the result of a natural process of repair, what is the use of the physician? I would reply by asking you to consider what is

the use of the engine-driver to a train placed beneath his charge. He does not generate the motor power that moves the carriages and conducts them to the end of the journey, but nevertheless the safety of every passenger depends upon his vigilance. He acquaints himself with each part of the line, and moderates or increases the speed of the engine as is necessary; and, above all, he is ever on the watch for the signals that tell of danger in his front. In like manner the physician must make himself acquainted with the natural course of each malady he has to treat: he must lessen or increase the activity of the various organs that may be primarily or secondarily affected; and he must watch for, and as far as possible obviate, the various complications that are apt to arise in the progress of the disease.

There are some rules that you must bear in mind in the treatment of all diseases, as they are of general application, and you cannot safely neglect the simplest of them in the management of any important disorder. They are, indeed, usually kept in view by all physicians of experience, and I only insist upon them here so that the student may constantly retain them in his memory. The first of these rules is—

A. *Always make it your first object to ascertain, and, if possible, to remove the cause of a disease.*

This is the most important rule in the science of therapeutics, and you must accustom yourself to apply it in every case that comes beneath your care. Without it medical practice becomes mere empiricism, however learned or skilful may be the practitioner.

A little consideration will show you how wide and general is the application of this rule. A patient, we will suppose, consults you for certain symptoms that point to some disorder of the liver, and on examination you discover the organ to be greatly enlarged. Instead of prescribing, in a routine way, certain drugs that are supposed to act upon the hepatic structures, you should first seek for the cause of the enlargement. It may be the result of a dilated heart, which, by an obstruction to the flow of the venous blood, has set up acute congestion of the liver; and in such a case bloodletting, or digitalis and other diuretics, may be successfully employed. But it may be caused by a collection of fluid in the pleura which has

congested the venous system, and the aspirator must be employed to remove the pressure from the pulmonary circulation. On the other hand, the enlargement may be the result of long-continued indulgence in alcohol, and the prohibition of what has acted as a poison becomes the most important part of the treatment; or the swelling may have arisen from syphilis, and will yield, not to bloodletting or digitalis, but to a course of mercury or iodide of potassium.

The same rule of ascertaining, if possible, the cause of a disease is as important in chronic as in acute disorders, and is as necessary for the prevention as for the removal of a malady. For example, a gentleman had suffered for some years from severe attacks of asthmatic bronchitis, for which he had been treated without success by various practitioners. It was, however, observed that the attacks generally occurred once a fortnight, and very often on a particular day of the week. Further inquiry elicited the fact that on the previous day he generally attended a cloth market, the atmosphere of which was loaded with dust. As particles of wool are very irritating to a sensitive bronchial membrane, he was recommended to give up this part of his business, and as soon as this advice was followed the attacks disappeared. The irritating effects, not only of dust, but even of animal exhalations, are often seen in medical practice. Some asthmatics suffer if they come near dogs, horses, or monkeys; and, by bearing this in mind, you may often obviate attacks over which drugs seem to have but slight control. Again, nothing is more common than to meet with a catarrh of the stomach which the most careful treatment is unable to relieve, because it is kept up by a habit of secret drinking. Here, nothing but inducing your patient to abstain entirely from all kinds of alcoholic stimulants will have the slightest effect; but if you can prevail upon him to do so there will be little necessity for medicines. These are but examples of what you will meet with daily, and your success will greatly depend on the acuteness with which you detect the causes of a malady, and the tact you employ in removing them.

But where you fail to discover a cause for a disease in the habits or occupation of your patient, you may often, especially in chronic cases, hit upon some constitutional ailment that has

given rise to the local disorder. Thus you may obtain a history of syphilis in an obscure disease of the brain, or of gout in a case of chronic dyspepsia, and by the exhibition of iodide of potassium or of colchicum you may rapidly relieve symptoms which other medicines had failed to remove. Or you may be able to trace a disease to an affection of some distant organ. For example, convulsions in children often arise from teething or from intestinal worms, and the use of the gum lancet or the administration of an anthelmintic may at once remove the cause of the irritation.

Experience will soon prove to you that a circumstance which in a healthy condition would exert no injurious influence may act most seriously upon an organ when it is diseased. For instance, food that would ordinarily produce no ill effects may excite incessant vomiting if taken into an inflamed stomach, and an amount of light or sound that would be grateful to a healthy person will often act most injuriously upon one suffering from delirium.

You see, then, that it is the first and most important duty of a physician to detect and remove any circumstance that has produced or may be keeping up a disorder. In no particular do practitioners more completely differ than in the constancy with which they keep this principle before them. Attention to it often compensates for a lack of scientific knowledge, whilst its neglect will render the most accurate acquaintance with pathological and therapeutical science comparatively useless.

B. *In all acute disorders watch carefully the condition of the heart and circulatory system.*

Most acute diseases are the results of some morbific material imported from without, or formed within the animal body. For example, scarlatina is produced by a poison communicated from one person to another, whilst an attack of gout is the consequence of an accumulation of urate of sodium which has been generated within the system.

In the majority of acute disorders there is a tendency to recovery after a certain time has elapsed, in case there is no failure in the function of any of the organs that are essential to life. Now the heart is especially necessary for the continuance of existence, and on this fact is founded the above

general rule, which is applicable to the treatment of all *acute* diseases.

You must have remarked how a careful physician at each visit examines the pulse, and often the heart, in every acute disorder. This is to enable him to ascertain the state of the circulatory system, for he knows that any undue excitement or any failure of the heart's power may give rise to serious consequences. In the early stages its force is often greatly increased, and if there be a co-existing contraction of the smaller arterioles and capillaries, the tension of the arterial circulation will be augmented, and an embarrassed state of any organ that is especially liable to disease may result. In this case he directs his efforts to moderate the undue excitement. But in the later stages, and sometimes also in the early periods of an acute disorder, he has generally to combat a failure in the power of the heart. This may arise in different ways. The heart, like the other muscles of the body, is often enfeebled from the first by the cause producing the disease, or its failure may be the result of an increased rapidity of action. In each revolution of the organ a certain time is allotted to repose, during which its power is recruited; but when its frequency is augmented, the period of rest is, of course, diminished, and, as in the case of all other muscles, the effects of over-work are shown by exhaustion. But from whatever cause the failure may arise, it is your first duty to watch the state of the heart from day to day in every acute complaint, and to employ appropriate treatment at the earliest indication of feebleness.

In the present day some practitioners would object to the statement that you may ever be called upon to moderate the action of the heart by the employment of energetic treatment. Such persons, I believe, take a limited view of disease, and do not make sufficient allowance for the variations arising from different conditions. Let me show you how the necessity for changing the ordinary practice in different circumstances was first impressed upon my own mind.

After a lengthened hospital experience as a student, I had arrived at the conclusion that bloodletting and all other depressing measures were always injurious in pneumonia, and that we should either allow the disease to run its course, or should

support the strength by stimulants. With such impressions I entered upon practice in an agricultural district, and one of the first important cases that came under my care was one of pneumonia. I could not fail to remark that the breathing was more oppressed, the pulse harder, and the general distress greater than I had been accustomed to see. I, however, abstained from all active treatment, and hoped the patient would go on favorably. Day by day the symptoms increased in severity, and in the second week she succumbed to the disorder. Mortified at my want of success, I called upon a medical friend and asked him how he was in the habit of treating pneumonia. "Oh," replied he, "in the ordinary way; free bleeding, tartar emetic, &c." To all my efforts to prove to him that bleeding could never cure any inflammation, he only replied that the practice was successful. Shortly afterwards another case presented itself. Here, again, the symptoms were so urgent, I felt that active treatment of some sort was required, but prejudice stood in the way, and the patient was only ordered a saline aperient. At the next visit he was much worse, and in desperation I opened a vein, intending to abstract only a small quantity of blood. It spurted out, however, so freely that a considerable quantity was lost before its flow could be arrested. The patient was at once relieved, and rccovered without a bad symptom.

During the whole of my residence in that part of the country I invariably used bleeding in the first stage of pneumonia, and always with relief to the patient. I returned to a manufacturing district, and one of the first cases I was again called upon to treat was one of pneumonia. Finding he had not been bled, I used the lancet; but the blood merely trickled from the vein, and he became so faint that it was necessary to stop it. The man sank rapidly, and from that day I have never had occasion to use the lancet in this disorder.

Now you will here remark that the same disease required different treatment because the condition of the patients was different. In the countryman, who was a strong and vigorous man with his vascular system full of fluid, the reaction of the heart set up by the inflammation was intense, the blood was driven with great force through the diminished area of the pulmonary capillaries, and in consequence the right side of the

heart and the entire venous system became overloaded. In all probability this distension would have been followed by failure of the muscular power of the heart, and eventually by death. The venesection at once relieved this condition, and by lessening the quantity of blood that had to be propelled through the pulmonary circulation, enabled the right side of the heart to contract, and consequently gave time for the inflammation to subside, and for the repair of the mischief. In the latter case the patient was in a feeble state of health when attacked by the pneumonia, and the heart was unable to contract with sufficient force to keep up the circulation. If I had been wise enough to resort freely to stimulants, so as to assist the power of the cardiac muscle, instead of diminishing its force by bleeding, the patient's life might have been perhaps preserved. The art of the physician, therefore, consists in *watching* the condition of the organs essential to life during acute disease. He ought not to treat the pneumonia, but the patient who is suffering from pneumonia, and who presents certain abnormal conditions of his system that may call for his interference.

The third rule you will find useful to remember is—

C. *In all acute diseases watch carefully the state of the nervous system.*

The nervous and vascular systems are so closely connected that an undue excitement or failure in the one is usually associated with a corresponding condition of the other. Thus, a loss in the regulating power of the nervous centres over the production of the heat of the body generally coincides with an increased rapidity of the pulse. This is, however, not always the case, and the physician is called upon to watch the temperature of the body as carefully as he does the contractions of the heart or the tension of the vascular system. A practitioner of the present day can scarcely understand how his predecessors were able to do without the thermometer, and he learns to rely as much upon its variations in disease as the seaman on the indications given by his barometer. In other instances the derangement of the nervous system is shown by sleeplessness, delirium, or muscular twitchings, and these the careful physician regards as signals of a coming danger that requires prompt and careful treatment. In every case, then, of acute disorder you

should keep a careful watch for any indication of an undue derangement of the functions of the nervous centres.

You will observe that I have only said you are to *watch* the condition of the vascular and nervous systems in acute disorders. You must not suppose that it is necessary that you should interfere in every case. If, for example, you are attending a person with measles or pneumonia, and the derangement of the heart and nervous centres is not greater than you might reasonably expect, you allow the disease to run its course without any meddling on your part. But if the heart begins to fail, or the heat of skin becomes excessive, you must at once adopt such measures as may stimulate the vascular system or lessen the ill effects of the high temperature on the blood and tissues. In order, therefore, to know when to interfere, you must be acquainted with the course of each disease, with the symptoms that necessarily arise from it, and in what order and for what period they usually present themselves. No amount of reading will teach you the natural history of disease; you can only acquire it by careful and accurate observation.

D. *In all acute diseases insist upon perfect rest.*

The greater portion of the body consists of muscular structure, and excepting when in the recumbent position some part of it is in more or less constant action. At each contraction of a muscular fibre the arteries supplied to it dilate; thus an augmented quantity of blood is directed through it, the rapidity of the current of blood is increased, and, as a necessary consequence where muscular action takes place to any great extent, the heart is obliged to contract more quickly and forcibly to keep up the circulation. Again, we see the effects of muscular action upon the nervous system in a state of health in the production of fatigue, and we may, therefore, be certain that all muscular effort is associated with an expenditure of nervous force. The effect, then, of bodily exertion is to excite the vascular and nervous systems; and these, we have already seen, are more especially apt to suffer injury in all acute maladies. Whenever a muscular fibre contracts sarcolactic and carbonic acids are produced, and in all probability an increase of heat is the result. It is most likely from this cause that the temperature of a patient suffering from fever is often higher on the day of his

admission into the hospital than at any subsequent period; and it is probably from the expenditure of nervous force during exertion that many persons sink from exhaustion who have made forced journeys to reach home whilst suffering from acute disorders. You cannot, therefore, too strongly insist upon your patient remaining in bed, not only as long as the temperature is above the normal point, but also until all the symptoms of acute disease have disappeared.

E. *In all acute diseases attended by fever the diet of the patient should consist only of liquid food.*

In most acute disorders, and especially in those attended with fever, there is a diminution in the functional powers of the digestive organs, and after death we usually discover a catarrhal condition of the mucous membrane of the stomach and intestines. When the stomach is acutely inflamed its secretion possesses very little power to dissolve the materials placed within it, and consequently any solid food that may be taken remains undigested, and, by its subsequent decomposition, is liable to set up further irritation in the gastro-intestinal tract. As an indication that solid food is injurious, we almost always find that one of the earliest symptoms of any acute disorder is a loss of the normal appetite. This repugnance to food and the great desire for liquids are probably intended by nature as means of limiting the duration of acute maladies; the failure of the digestion checking the introduction of new material into the disordered system, whilst the increased supply of water assists in the chemical changes that take place in the affected structures.

F. *In all* CHRONIC *diseases you must direct your attention to the organs engaged in nutrition.*

In chronic disorders a much more complex problem is presented to the practitioner than in those that are acute. He has no occasion to watch the heart or the nervous system unless these organs are especially affected, but he has to determine what are the circumstances that prevent the reparative power from restoring to health the injured structures. It is particularly in chronic complaints that a knowledge of the causes of disease is of so much value, and the physician is called upon to use all his tact to trace the morbid conditions to their sources. As a general rule, where no removable cause can be discovered, the

power of repair is obstructed by some abnormal condition of cell-growth, such as cancer or tubercle; or some acquired or hereditary condition, such as gout, rheumatism, syphilis, &c.; or by some imperfection in the quantity or quality of the blood supplied to the tissues.

One of the first and most important points to be attended to is the regulation of the diet. In the selection of food you must bear in mind that it is necessary to choose not only what is nutritious and likely to agree with the digestive canal, but what is appropriate for the complaint you have to treat. Thus a liberal supply of animal food is essential for the improvement of an anæmic condition, whilst you must diminish the amount in cases of feeble digestion. Where there is a tendency to the formation of sugar it is of the first importance to exclude all materials of a starchy or saccharine character. Again, I need scarcely remind you that oxygen is as necessary to nutrition as food, and you will constantly find change of air and regular exercise restore a patient to health when drugs have failed to relieve.

In prescribing drugs for chronic disorders there is no more common mistake than to suppose that the use of tonics is all that is necessary. In the greater number of cases some imperfection exists in the functions of the excretory organs, and, at some period or another, you will find it necessary to pay attention to the kidneys, bowels, skin, or liver. Indeed, it is always wise to ascertain first how these are acting before you commence with strengthening remedies.

Whilst giving a tonic it is a useful plan either to change the drug occasionally or to omit it altogether for a time. This is more especially the case with the more powerful medicines, such as iron, arsenic, &c.; and their efficiency will be further increased if you now and then substitute for them some alterative, so as to regulate the digestive organs. In cases of chronic phthisis, for instance, you may with advantage every now and then omit tonics and cod-liver oil, and prescribe a few doses of Pil. Hydrarg. with rhubarb and soda, or some similar alterative. Unless such a precaution is taken, a long course of tonics is apt to derange the digestive functions, so that the patient ceases to derive benefit from their use.

In every disorder certain secondary complaints or complica-

tions are apt to arise. For example, you meet with pneumonia in measles, sore throat and acute inflammation of the kidneys in scarlatina. These complications often require careful attention when it is not necessary to interfere with the original malady. But it is not uncommon for two or three complications to occur at once in the same patient. Thus a person affected with kidney disease may have dropsy and erysipelas of the legs, and at the same time may be attacked with pleurisy or pericarditis. Under such circumstances the best rule is to direct your treatment against the affection that seems to be the most dangerous to life, or against that which you are most likely to overcome.

In the use of drugs there are a few points that are especially worthy of notice. Thus they are always most certain in their action when applied directly to the affected structure. When they have to traverse the circulation in order to reach an inflammation of the skin or mucous membrane, they are much less likely to prove efficient than when brought into immediate contact with the nerves and vessels of the diseased part.

Never forget that most medicines require time to enable them to act upon the system. Even our most potent drugs, such as digitalis and mercury, must be given in repeated doses before they can influence the nutrition of a diseased structure. There is no more certain sign of a bad practitioner than the constant changing of his remedies. It shows either that he is doubtful of his diagnosis, or that he is uncertain as to the best means of subduing the disease he has to treat. An anecdote that used to be related by an old teacher of my own has often been of service to me when I have felt impatient at not attaining rapid results. Dr. S. was requested to see a patient along with a young practitioner. When they retired to consult upon the case the physician thus addressed his junior colleague:—"As we seem quite agreed upon the diagnosis, you had better give him some digitalis." "I prescribed it," said the other, "but it did not agree with him." "Then have recourse to mercury in combination with it," remarked Dr. S. "I did so," was the reply, "and it made him so ill I was forced to give it up." "Give him some acetate of potash," was the next suggestion, but this had also been ineffectually tried. Much amused, the senior recom-

mended various diuretics, but all had been employed in vain. At last Dr. S. addressed the practitioner in these words:— "Your patient has, I find, been under your care for ten days, and in that time you have employed at least ten powerful drugs, no one of which has succeeded. Now I only know of one remedy likely to be successful in such a critical case." "I am sure I shall be most grateful to you for any suggestion," replied his colleague, "after so much disappointment." "Well, then, sir," rejoined the physician, "try some *patience*, for I fear that the want of this has been the only cause of your failures." "And that remedy, gentlemen," Dr. S. used to say, "cured the patient."

The only means of preventing that constant change of treatment which is so common amongst young practitioners is for you to take time before you prescribe; make up your mind as to the diagnosis, weigh carefully all the circumstances of the case, and having once decided upon a line of treatment, follow it out perseveringly.

You may, however, say, "This may be all very well for hospitals, but it would never do in private practice; the desire for a constant change of remedies is not my fault. How can I keep to the same prescription when a patient complains at every visit that it is doing him no good, and when I feel I must either indulge his caprice or be replaced by another practitioner?" Now I once knew an old surgeon whose drug bill must have been very moderate. He used the lancet freely, and, in bad cases, calomel, opium, or active purgatives. For ordinary cases he kept only two mixtures. One, which he named "Mistura salina," was composed of nitre and water; the other, which he called "Mistura stomachica," contained carbonate of ammonia and infusion of quassia. Either of these he would so ingeniously alter in appearance and taste with saffron, roses, or ginger, that his patients took it for weeks, not only without grumbling, but without any suspicion that no practical alteration had been made in it. Without adopting the very limited pharmacopœia of my old friend, you may take a hint from his practice. You may vary the *non-essentials* of your prescriptions so as to keep the most captious patient in good humour, at the same time that you persevere with any remedy you may think it important to

administer, Besides this, there are in every disease various symptoms that of themselves demand attention. An old proverb says, "A good physician should have a plaster for every sore;" and you may, by relieving symptoms, establish a reputation for medical activity that will enable you to persevere with the main object you have in view.



CHAPTER II.

ON THE INDICATIONS FOR THE TREATMENT OF ACUTE LOCAL DISEASES.

The application of the general rules mentioned in the last chapter requires to be modified according to the nature of the disease and the physiological importance of the organ affected. It will be evident, however, that the same pathological change, whenever it occurs, must be treated on similar principles. Thus you combat acute inflammation of the peritoneum in the same manner as pleurisy, but the medicines employed, or their doses, may require to be varied according to circumstances. I may here also mention that the principles of treatment in medicine and surgery are the same, both being founded on a knowledge of physiological and pathological laws. Whatever, therefore, you have learned in your surgical studies will aid you in acquiring definite views respecting the management of medical cases.

1. *Indications for the Treatment of Acute Inflammation.*

In all acute inflammations there is first observed, in such animal structures as can be examined by the microscope, a dilatation of the smaller arteries and an increased rapidity of the current of blood through them. The capillaries and smaller veins soon become overloaded with blood-cells, and the quickness of the stream gradually lessens until it is completely arrested. The white corpuscles escape in great numbers through the walls of the capillaries, and congregate in the surrounding structures. If the tissue be an unimportant one, and the cause which has produced the morbid condition be withdrawn, the parts gradu-

ally resume their normal state. But where the inflamed structure is physiologically important, the local irritation excites the vascular and nervous systems; the contractions of the heart are increased in rapidity and force, the temperature of the whole body is augmented, and other signs of disorder of the nervous centres make their appearance. As, then, in inflammation of any important organ the vascular and nervous systems are affected, both locally and generally, it is necessary for the practitioner to direct his attention mainly to them. Of course where the complaint is not of a serious character he will content himself with merely attempting to relieve such symptoms as may be especially troublesome, but when the general or local disturbance is likely to prove dangerous he is forced promptly to interfere.

A. In every case we should first ascertain, as far as possible, the cause of the inflammation. Where a mucous membrane or the skin is the seat of the malady it is often possible to remove the exciting cause. In bronchitis, for example, the shielding of your patient from cold air or damp, or from the irritation of dust, may suffice to relieve him. In catarrh of the alimentary canal it is always requisite to scrutinise most carefully the quantity and quality of the food. The inflammatory affections of the solid viscera often have their source in an abnormal condition of the blood, such as is produced by rheumatism or gout; and before determining on your line of treatment you must ask yourself whether there is any evidence of these being present. If such prove to be the case, the fact must be borne in mind both in the prognosis and in treatment. Still more frequently you discover that there is some imperfection in the eliminating organs. This is the reason why the test-tube is so constantly employed in order to detect renal disease in cases of pneumonia, bronchitis, and serous inflammations, and why we so carefully examine the liver in all inflammatory affections of the digestive tract. Whenever you find an attack of inflammation arising from a disease of an excretory organ you should direct your treatment to relieve the primary as well as the secondary affection.

But we also meet with a very large class of inflammatory disorders in which there is from the first an enfeebled action

of the heart and a depressed state of the nervous centres. Such are named by some pathologists "infective inflammations," and they are now generally recognised as the result of changes set up by the presence of bacteria in the blood and tissues of the body. We meet with them, for example, in pyæmia, diphtheria, typhus, smallpox, and other eruptive fevers. In the treatment of these the condition of the general system chiefly requires your attention, as the course and termination of the local malady depend entirely upon the cause from which it has arisen.

B. You have the power of increasing or diminishing the tension of the vascular system, either generally or locally, and the choice of your line of treatment in this particular is usually the chief difficulty you meet with. Formerly, in all cases of inflammation of any important organ, it was the universal custom to bleed. This became so much the recognised method of treatment that most physicians looked upon bloodletting, not as necessary to relieve an abnormal state of the vascular system, but as an antidote for inflammation. I have known an old practitioner who was puzzled with a case place his finger on the patient's pulse, and then remark that "the pulse would bear bleeding," as though venesection was the natural escape from his therapeutic difficulties. Of late years medical opinion has set in the opposite direction, and you will meet with many who think they can always overcome inflammation by increasing the action of the heart by means of stimulants. Although this idea is as unscientific as the other, it is certain that patients do not bear the loss of blood in the present day so well as formerly. It has been supposed that there has been a change of type in disease, so that the same pathological change—for example, pneumonia—now occurs along with different conditions than in the days of our forefathers. My own observation leads me to think such is the correct view of the case, and that it is the result of the overcrowding of the population, and of the increased bodily and mental excitement of modern life. A little consideration will show you this is a practical matter, and not one merely of speculative interest. If this change of type be true it may alter again, and you may at some future time or in some other place have to reverse the line of treatment you now adopt. I think there is little doubt that, although venesection will not cure

inflammation, it will in many instances relieve a dangerous state of vascular tension either of the venous or arterial system, and thus afford time for the morbid action to subside.

Many practitioners will allow that if in any inflammation of the chest the right side of the heart and the venous system become overloaded with blood, venesection will prove of use, but in cases of over-tension of the arterial system they regard bleeding as inadmissible. The older writers, however, pointed out a hard state of the pulse as the special indication for bleeding. They taught that if in a young and vigorous individual a pulse that is not readily compressed co-existed with inflammation of an important organ, venesection should be performed. I believe they were quite correct, but in the present day it is exceedingly rare to meet with this hard pulse, and consequently bleeding, on their own principle, is seldom required. You must not, however, confound the pulse of old age with the hard pulse. The former is hard, not from undue tension of the circulation, but because its coats are rigid. You can easily distinguish it by first emptying the vessel by the pressure of the finger, and feeling it while thus compressed.

There are other methods of depleting the circulation in inflammation besides bleeding. By purgatives, more especially those of the saline class, you can drain away a portion of the more fluid part of the blood without depressing the action of the heart too severely. In most cases you will find purgatives of value, for, in addition to the depletion they produce, they remove any source of irritation that may be present in the intestinal canal.

In some instances it is advantageous to reduce the heart's action by tartar emetic. This powerful remedy is most efficacious in pneumonia and bronchitis, but it may be used whenever you think it desirable to depress the circulation. Aconite and the veratrum viride are also employed for the same purpose, but they are not so generally useful as antimony.

The blood-vessels of an inflamed part are frequently overloaded, whilst the state of the general circulation calls for no interference. The pulse is soft, although the local symptoms are severe. Here you can often relieve by leeches or cupping, when the use of the lancet would be detrimental. This is more

especially the case where the serous membranes are affected. You will often see large doses of opium fail to afford relief, when, after the application of leeches, a much smaller quantity will give almost immediate ease.

But whether you employ local bloodletting or not, you can generally alleviate the symptoms of acute inflammation by cold or hot applications. The former may be employed in the shape of ice, or as cold or evaporating lotions; the latter as poultices or fomentations. There is often great difficulty in saying whether hot or cold applications will be most useful, and we are advised to be chiefly guided by the sensations of the patient. As a general rule, cold is most beneficial when there is much heat of skin and the inflamed part is external; hot applications when the internal organs are affected, or there is a tendency to suppuration.

You should bear in mind that defective nutrition alone is able to induce inflammation, and that in the present day this is one of the chief sources from which it arises. In "infective inflammations" the local affection runs a most rapid course, although attended with a feeble condition of the circulation. Here, of course, you are called upon to stimulate, not to depress the heart, to augment, not to lower arterial tension. You therefore trust to alcohol, ammonia, ether, and other stimulants. It was in this class of cases that cinchona first achieved so great a reputation, and it is still in them that we now prescribe quinine so largely. Locally, all cold applications must be forbidden, and hot poultices or stimulating lotions alone allowed.

C. In every case of acute inflammation affecting an important organ it is necessary to soothe undue irritation of the nervous centres, to relieve pain, or to reduce fever. Of late years, since the hard pulse formerly described as being commonly present in inflammatory conditions has been less frequent, attention has been directed to the nervous rather than to the vascular system. Consequently the administration of opium has replaced, to a great extent, general and local bloodletting. You must, however, bear in mind that the routine system of prescribing sedatives in every case of inflammation is as unscientific and as likely to end in failure as the former plan of venesection. By the use of sedatives we relieve pain, and thus place the affected part in a

better condition for recovery, but in many cases we do more than this,—we give rest to the structures. When a joint is inflamed the surgeon seeks by mechanical means to ensure repose. When a serous membrane, which is similar in structure to the lining of a joint, is inflamed, we apply the same principle in its treatment. For example, although we cannot mechanically restrain the motion of the abdominal organs in a case of peritonitis, yet by the free administration of opium we can so limit the motions of the parts covered by the peritoneum that we produce a state of comparative rest. Where opium is contra-indicated you may use some other sedative, such as belladonna, conium, or hyoscyamus, as a substitute.

Pain in inflamed structures is relieved by the same measures you employ to lessen vascular engorgement, but where the suffering is intense you must use sedatives locally. You may add opium, belladonna, chloroform, aconite, or some other remedy of this class, to the fomentations or poultices. In other cases you inject morphia subcutaneously, or apply it upon a blistered surface.

D. The necessity of rest in all acute diseases has been already pointed out, and it is especially requisite in inflammation. In directing the position of your patient you must select that which will facilitate the return of the venous blood from the affected structures. In surgical practice you must have constantly noticed the beneficial results of attention to this point. A man enters the ward with an inflamed leg, the veins being distended with blood. You raise the limb above the level of the body, and in a short time it becomes less red and swollen, and the pain is alleviated. In medical cases, of course, you vary your position according to the part that is affected. Thus, in cerebral inflammation, the head is raised, so as to facilitate the return of the venous blood; in pulmonary disorders you adopt a similar posture, in order that the breathing may be carried on as easily as possible; whilst in abdominal diseases you keep the patient in the recumbent position.

But it is still more important to place every inflamed structure as far as possible in a state of rest as regards its function. Students constantly neglect this point, and think they have done sufficient when they have ordered their patients to bed. If an

artificial opening be made in the stomach of any of the lower animals the mucous membrane appears pale and bloodless if the inspection is conducted whilst the animal is fasting. But as soon as food is placed in the organ the arteries enlarge and pulsate, the surface becomes everywhere injected, and secretion commences. This increased determination of blood to a part in a state of functional activity tends, of course, to increase the vascular engorgement whenever inflammation is present, and may light up a diseased action which is subsiding. A woman was under my care with an inflamed gastric ulcer, which produced great pain and constant vomiting. She was confined to bed, and restricted to milk and farinaceous food, and quickly began to improve ; the pain diminished, vomiting ceased, and we hoped she would soon be well. But her appetite returned, and she clamoured for solid food. A newly appointed house physician took upon himself to order a chop in compliance with her entreaties. The very next day she was attacked by violent hæmorrhage from which she nearly perished, and from that time the former signs of improvement vanished, and she left the hospital no better than when she entered it. It is often a point of great difficulty to determine when the inflammation of an organ has so far subsided that you may permit it to resume its functions. As a general rule it is the safest plan to do this gradually, watching the effects of the change, and regulating the treatment according to its results.

E. As a general rule, restriction to liquid food is necessary in all acute inflammations of a serious character, but the nature of the food must be determined by the condition of the patient. Whenever you find it necessary to lessen the action of the heart all stimulating food should be forbidden. The patient may be allowed to drink freely of water, toast water, or barley water; he may take milk, farinaceous food, and in some cases beef tea or animal broths; but alcohol in all forms, as well as solid food, must be forbidden. If, on the contrary, the circulation is in a depressed state the diet must correspond to the character of the drugs prescribed. You support the failing strength of the patient with strong beef tea, soup, milk, eggs, jellies, &c., in small quantities and at frequent intervals, and in most of such cases alcohol in some form is required.

G. In all inflammations there is an augmented exudation of the liquor sanguinis from the blood-vessels. But, in addition to this, there is an increased activity in the cells of the inflamed structures. This may result either from the large number of white cells which have migrated from the congested vessels, or from the affected tissues being stimulated by the disease. Now the exudation may, by the irritation it produces, keep up inflammatory action, or it may obstruct the recovery of the inflamed organ mechanically. In either case you may have to interfere, so as to permit the reparative power to come into play. For example, a case of pleurisy may have terminated (as far as the inflammation is concerned), but the exudation may be still compressing the lung and preventing the recovery of its functions. Here the use of the aspirator removes the load from the organ, and allows the due expansion of the pulmonary structures.

Formerly it was universally believed that mercury exercised a specific effect on the inflammatory process, and had the power of preventing and absorbing exudations. The student was taught, in every case of inflammation, to prescribe this drug, and to persevere with it until salivation showed that the system was saturated with it. At the present day it is seldom employed, and its power of checking inflammation is doubted. I have, however, seen mercurial treatment of decided benefit where repeated attacks of subacute inflammation have occurred in the same structure, more especially in the case of the serous membranes.

In the removal of inflammatory exudations you must vary your method of procedure according to the structure affected. If the exudation is liquid, as in the case of the serous membranes, you may often assist absorption by lessening the amount of fluid in the vascular system, by means of hydragogue cathartics, diuretics, or sudorifics. Where the mucous membranes are affected you may have to alter the state of the secretions, or to assist in their expulsion, by stimulating the muscular structures that surround them. Again, you may often remove exudations of a solid character by the use of blisters, or the application of iodine or other irritating substances.

From the above considerations we may deduce the following rules :

A. *Ascertain and, if possible, remove the cause.*

B. *Watch carefully the condition of the heart and circulatory system.*

a. The tension of the whole vascular system may have to be lessened.

b. The action of the heart may have to be increased.

c. The local congestion may have to be diminished.

d. The inflamed part may require to be stimulated.

C. *Watch carefully the condition of the nervous system.*

a. It may be necessary to act on the nervous system generally.

b. It may be necessary to act on the nerves of the part affected.

D. *In all acute inflammation insist upon rest.*

a. General rest.

b. Functional rest of the affected organ.

E. *In all acute inflammations the diet should consist of liquid food.*

G. *It may be necessary to remove the exudations resulting from the inflammatory process.*

a. By mechanical measures.

b. By medicines.

2. *Indications for the Treatment of Hæmorrhage.*

Hæmorrhage may occur from the laying open of an artery or vein by accident or ulceration, from a congested state of the circulation of an organ, or from some alteration in the physical or chemical condition of the blood that permits it to escape through the walls of the vessels.

A. It is necessary to discover the source of the bleeding, and this often requires considerable care and trouble. I once saw a young woman who had been ineffectually bled from the arm, leeched, and blistered, on account of a spitting of blood supposed to arise from the lungs. The most careful examination of the chest failed to detect any pulmonary disease, but on opening the mouth the cause was at once apparent. A fungoid projection of the gum was seen in the neighbourhood of a decayed tooth, and the forceps at once relieved her of the bleeding that the active treatment she had undergone had only

tended to increase. Where the hæmorrhage results from congestion of any organ produced by a disease of the heart or liver, the treatment must be directed to relieve the obstructed circulation. An altered condition of the blood, on the contrary, requires mineral or vegetable astringents to counteract its tendency to transude through the vascular walls. Whenever it is possible you should trust rather to local than general hæmostatics, as they lose much of their efficiency when they have to traverse the circulation before reaching the affected structure.

B. It used to be the custom to bleed in all severe hæmorrhages, from the idea that coagulation of the blood at the injured part would be favoured by it. This is now seldom practised, because a slight hæmorrhage does not require it, whilst a severe loss of blood of itself sufficiently depresses the action of the heart. In certain conditions, as in some hepatic disorders, it may be necessary to deplete the vascular system by saline aperients, but the same objection exists against their use as in some cases of acute inflammation, viz. that their action disturbs the bodily rest which it is so necessary to enforce.

As a general rule, your treatment must be directed to the part from which the bleeding takes place, and you should seek either to constrict the walls of the vessels or to favour the coagulation of the blood. The use of ice is one of the most powerful means at your disposal. A bladder or india-rubber bag filled with fragments of it should be placed over the affected organ, and the ice renewed as often as is necessary. Tannic acid or perchloride of iron may be used locally where the bleeding part can be reached, or acetate of lead, gallic acid, dilute mineral acids, or alum may be given internally when the hæmorrhage is beyond the direct application of styptics. Plugging is the most efficacious method of treatment when the bleeding is from the nostril or other cavity admitting of its application. In the majority of cases of bleeding from the nose, if you place the legs of the patient up to the knees in a hot water bath the sudden determination of blood to the feet will suffice to check the bleeding. In all probability ligatures or bandages placed around one or more of the limbs, so as to congest the veins whilst the arteries are not compressed, act in a similar manner, and by this means you may often restrain a

hæmorrhage from an internal organ when medicines have proved useless. Of late years ergot has been very generally employed to contract bleeding vessels, and may be administered either internally or subcutaneously.

In the majority of cases it is necessary to stimulate rather than depress the circulation. For this purpose you may employ alcohol, ammonia, or ether. At the present day both the public and the profession are apt to have recourse to stimulants very unnecessarily. You should remember that the faintness produced by the hæmorrhage often answers a good purpose, by promoting the coagulation of the blood in the vicinity of the injured vessel.

C. You will rarely find it necessary to have recourse to sedatives, as the loss of blood has itself a depressing effect on the nervous centres. When there is much palpitation you may require the aid of digitalis, henbane, or hydrocyanic acid, to soothe the excitement of the heart, but this seldom occurs except in severe cases. Where bleeding takes place from the digestive tract, opium is of use in restraining the action of the muscular coat, and thus preventing any clot that may have been formed around the ruptured vessel from being dislodged from its position.

D. Rest is of the utmost importance in every case; often all that is required is in this way to quiet the heart's action, and so enable the circulation of the injured part to regain its normal condition. Functional repose is as necessary as muscular rest. If, for example, the bleeding be from the lungs, insist that your patient abstains from talking, as well as from all change of position. If from the stomach, all food must be withheld for many hours after the bleeding has ceased. When the intestines are the seat of the mischief, their action, as I have said before, may be prevented by opium, and repose thus given to their muscular coat.

E. The same care should be taken as regards diet as though fever were present. Severe hæmorrhage checks the gastric functions, and the food should be on this account as digestible as possible. During the attack the food should be cold. The best means of relieving the thirst that so generally follows severe bleeding is to administer, from time to time, small pieces of ice,

which the patient should suck. By lowering the temperature this is often of itself effectual in putting a stop to the loss of blood.

We may sum up the indications for the treatment of hæmorrhage as follows:

A *Ascertain, if possible, the cause and the source of the bleeding.*

B. *Direct attention to the state of the heart and vascular system.*

a. You may act on the vascular system generally by means of astringents.

b. You may apply astringents locally whenever the source of the bleeding can be reached by them.

c. The action of the heart may have to be increased.

C. *Watch the condition of the nervous system.*

a. Sedatives are occasionally required.

D. *In all hæmorrhages insist on rest.*

a. General rest.

b. Functional rest of the affected organ.

E. *Food should be in a liquid form, and be given cold.*

3. *Indications for Treatment during an attack of Spasm or Neuralgia.*

Spasm or neuralgia may arise from any severe irritation affecting the nervous centres when these are in a healthy state, or a very slight irritation may produce them when the brain and spinal cord are unusually susceptible to impressions. The indications for treatment during an attack are different from those required to prevent its recurrence. At present we have only to consider the indications for treatment whilst the patient is suffering from spasm or neuralgia.

A. Spasmodic affections of the internal muscular organs mostly arise from some irritation of their mucous membranes. For example, spasm of the biliary ducts and of the ureters is usually due to the passage of calculi or of unhealthy secretions. But in other cases you require to search for the causes producing them at a distance from the affected structure. Thus asthma, which consists in spasmodic action of the bronchial tubes, may arise not only from the inhalation of air loaded

with damp or smoke, but may result from an undigested meal, from an accumulation of lithic acid in the system, or, as some assert, from a diseased condition of the mucous membrane of the nasal fossæ.

Of late years it has been the custom to look upon neuralgia as an idiopathic disease of the nerves. That such is the case occasionally there is no doubt, but in the majority of instances the pain in the nerve is the result of some irritation near to, or at a distance from, the seat of the suffering. It is a useful rule always to trace back the affected nerve to its root, and if in this way you cannot find a sufficient cause for the pain, you should carefully examine all the other structures supplied by branches of the same nerve. Nothing is more damaging to the reputation of a practitioner than the discovery that a pain that has been treated as neuralgia of the head is due to irritation of the gums or teeth, or that a node on the rib is the source of a supposed affection of an intercostal nerve, or that an aortic aneurism or disease of the spine has been overlooked, whilst attention had been exclusively devoted to the nerves irritated by these diseases.

B. It is seldom requisite to pay much attention to the vascular system, unless the heart itself be the seat of the malady. Of course, if there be any sign of failure of power, from the long continuance of a spasmodic attack, you should adopt appropriate treatment, but this is not often necessary.

C. In all cases our main reliance must be placed upon sedatives in some form or another. Where the suffering is severe, and at the same time you wish to relieve spasm, you may employ inhalations, such as those of chloroform or ether. Under special circumstances you may substitute for these nitrite of amyl. Where there is a tendency to general convulsions a different form of sedative is required, and bromide of potassium or chloral best meets the indication. The use of the warm bath is invaluable in soothing the nervous system, at the same time that it relaxes the tissues. The most important means of giving relief in neuralgia is the subcutaneous employment of sedatives, and morphia is far above all others in value. It is often advantageous to combine the morphia with atropine or antipyrine.

Even where you employ sedatives internally, you may often

give relief by their local use. Liniments, fomentations, and the application of morphia to a blistered surface are in many cases of great service. In some instances, when sedatives fail, the use of galvanism proves efficacious. Again, you may often relieve neuralgia by applying the sedative, not to the affected part, but to some other structure supplied by the same nerves. Thus opiate suppositories often prove useful in inflammation of the bladder, and a piece of wool soaked in a solution of cocaine or morphia inserted into the ear not unfrequently relieves facial neuralgia.

D. In all severe cases the patient seeks to give rest to the painful part, because he finds that exertion increases his sufferings. Place him, therefore, in such a position that the affected organ will be able to act most freely and easily. Although functional repose is usually necessary, it is not so essential as in cases of inflammation.

E. It is usually advantageous to keep the patient on liquid food, but this is not so necessary as in inflammatory affections.

We may, then, sum up the indications for the treatment of spasm or neuralgia as follows:

A. *Ascertain and, if possible, remove the cause*

C. *Watch carefully the condition of the nervous system.*

a. It may be necessary to act on the nervous system generally.

b. It is usually requisite to act locally on the affected part.

D. *During an attack of spasm or neuralgia insist upon rest.*

a. General rest.

b. Functional rest of the affected organ.

CHAPTER III.

ON THE INDICATIONS FOR THE TREATMENT OF CHRONIC LOCAL DISEASES.

Whilst in acute inflammation there is a tendency to recovery if life can be sustained sufficiently long to permit the disturbance of nutrition to subside, this is by no means so invariably the case in chronic inflammation. The structure may have been so injured that its restoration to a normal state may be impossible, and in other instances the vitality may be so much depressed that its repair may be slow and imperfect.

1. *Indications for the Treatment of Chronic Inflammation.*

A. In many cases there is some circumstance that is obstructing the action of the reparative power. When the mucous membranes are affected you must carefully investigate the habits of the patient. In every obstinate case you should search for evidence of a constitutional disorder; thus syphilis, gout, rheumatism, ague, and scurvy are potent causes of local diseases of a chronic form, which, if not removed, may produce complete destruction of the parts invaded.

When you can find no constitutional cause, always make yourself certain that there is no obstruction to the free return of blood from the affected part. Thus you should examine the state of the heart in every case of chronic bronchitis, and the liver in all long-standing affections of the abdominal viscera. The applications of this rule are very extensive; for instance, uterine catarrh may be kept up by an overloaded colon, and

chronic affections of the kidney may result from conditions that tend to congest the renal veins. Your surgical experience will have taught you that a varicose state of the veins of the leg may so interfere with nutrition that chronic inflammation and ulceration are produced, and you can, therefore, readily understand how venous obstruction can prevent repair when the more complicated circulation of glandular organs is in fault.

F. Of equal importance with a free return of the venous blood is a due supply of healthy arterial blood to any organ that is in a state of chronic inflammation, and consequently the due regulation of the diet and attention to the digestive organs are of primary necessity. In most cases it is requisite to improve the general health by means of tonics. You should also search for any circumstance that may be impairing the condition of the system; thus amongst the poorer classes you daily meet with chronic inflammation of various organs kept up by a failure of nutrition arising from leucorrhœa, prolonged suckling, or excessive menstrual discharge, and unless these are checked all your remedies will fail to secure a normal state of the blood. I need scarcely point out that the condition of the excretory organs has, in every obstinate case, to be carefully investigated, and one of the earliest lessons the student has to learn is the dependence of chronic inflammation upon an imperfect action of the kidneys or liver.

G. The presence of inflammatory exudations is a common cause of irritation. Thus there may be a large amount of pus in the liver, and until it is removed by surgical operation the reparative power cannot come into play. Or in other instances you may have to stimulate the absorption of serous fluid by the application of blisters or other irritants. Where pressure can be applied, as in thickening around the joints, you have a most valuable means of hastening the absorption of exudations.

In many cases of chronic inflammation, as, for example, when a mucous membrane is implicated, the structure of the part may have been so altered that it is incapable of restoration to its normal condition, and under such circumstances you may give relief by assisting the expulsion of the secretions. Where these are tenacious you may make them more liquid, or you may stimulate the muscular coat to increased action. In other cases

the secretions may be excessive in quantity, and it will be then necessary for you to employ astringent remedies.

H. *In chronic inflammation it is often necessary to stimulate or depress the circulation or the functions of the affected organ.*

The blood-vessels of a part, when weakened by long-standing inflammation, frequently lose their tone, and are incapable of contracting on their contents, and the circulation becomes so languid that the supply of blood is insufficient to enable the process of repair to take place. Hence you are called upon to assist the contraction of the vessels by the application of stimulants or astringents.

It is often necessary to stimulate the functional power of a part on account of its importance to the continuance of life. In chronic inflammation of the kidneys, for example, you may have to give diuretics, in order to eliminate the effete materials that have accumulated in the system. On the other hand, it is frequently advisable to lessen the functional activity of the inflamed structures. You meet with this in chronic ulcerations of the stomach and intestines, where rest is essential to enable the sores to heal.

We may sum up the indications for the treatment of chronic inflammation as follows:

A. *Ascertain and, if possible, remove the cause.*

F. *Direct your attention to the organs engaged in nutrition.*

a. Diet of the patient.

b. State of the digestive organs.

c. State of the eliminating organs.

G. *It may be necessary to remove exudations.*

H. *It may be necessary to stimulate or depress the circulation or the functions of the affected organ.*

2. *Indications for the Treatment of Dropsy.*

Under normal conditions a certain amount of the liquid part of the blood is constantly exuding through the vessels, and what is not required for the purpose of nutrition is returned by the veins and lymphatics into the circulation. But if from any cause the balance between exudation and absorption is destroyed,

the tissues become overloaded with fluid, and dropsy is the result.

A. The most obvious cause of dropsy is some obstruction to the venous circulation, which, by increasing the pressure in the interior of the vessels, augments exudation and prevents absorption; consequently, diseases of the heart and liver are the most common morbid states that produce it, and the measures required to relieve them are those best fitted to remove the superfluous fluid. You meet with dropsy also as a result of disease of the kidneys. Here a diminution in the amount of the fluid excreted is associated with an accumulation of substances which are apt to induce disease in the various tissues of the body, including the endothelium of the capillaries. The vessels are therefore overloaded with fluid, and incapable of preventing a certain quantity from exuding through their coats. In other cases the blood is alone in fault, and is so altered in its composition that it readily passes through the vascular walls. The first point, therefore, is to relieve the condition producing the dropsy; and, even where we are unable thus to remove the effused fluid, the treatment appropriate for the organ primarily in fault must nevertheless be borne in mind.

F. Since an alteration in the composition of the blood may give rise to exudation of an albuminous fluid through the walls of the vessels, it is evident that a properly selected and nutritious diet is of great importance in all cases. Alcohol is often necessary, not only to assist digestion, but also to guard against a failure of the heart arising from deficient action of any of the eliminating organs. In scurvy a proper supply of vegetable food is, of itself, usually sufficient to remove the dropsy, along with the other symptoms of the disorder. In many cases, after the main portion of the fluid has disappeared, a certain amount of œdema remains, which cannot be removed by diuretics or aperients. Under such circumstances the perchloride of iron and other tonics often afford relief by improving the quality of the blood, and in this way restraining the exudation of the serum.

It is especially necessary to attend to the digestive organs where the dropsy arises from diseased heart or liver, for the co-existing congestion of the portal system diminishes the secre-

tion of the gastric juice, and also lessens the absorptive power of the intestines. Tonics are usually required in every case at some period of its course.

One of the most important indications is to stimulate the organs that ordinarily excrete fluid from the system. By such means we seek to deplete the vascular system on account of the well-known principle that absorption is promoted by lessening the amount of fluid present in the circulation. As a general rule, the kidneys most readily relieve the body from any superabundance of water, and also do it with the least exhaustion. In order to produce an increased activity of these organs you must have recourse to agents that operate on the general circulation. When the kidneys are in an unhealthy state, you may attempt to deplete by stimulating the skin or the intestinal canal. It is often very difficult to obtain a sufficient elimination of fluid from the skin, and the measures required for this purpose are not unfrequently troublesome and inconvenient. A free action of the bowels is more readily set up, but it is apt to exhaust a person already enfeebled by chronic disease, and the frequent movements of the body it necessitates interfere with rest, which is, for other reasons, in most cases desirable.

We may sum up, then, the indications for the treatment of dropsy as follows:

A. *Ascertain and, if possible, remove the cause of the dropsy.*

F. *You must direct your attention to the organs engaged in nutrition.*

a. Attention to diet.

b. Attention to the digestive organs.

c. Attention to the eliminating organs.

3. *Indications for the Treatment of Dilated Organs.*

A. Up to a certain extent a muscle contracts with increased force in proportion to the load it has to raise, but when it is excessively or too long overweighted, its power of contraction is diminished or entirely lost. Consequently, although the hollow muscular organs are capable of sustaining any sudden and ordinary strain, they gradually yield and become dilated when they are long prevented from completely expelling their contents.

The cause producing the dilatation is often beyond our power to remove. For example, dilatation of the heart commonly results from diseased valves, and dilatation of the stomach from thickening of the pylorus, neither of which conditions we can alter by medicines. But to prevent a dilatation from increasing, we must reduce, as far as possible, the quantity of the materials that pass through the affected organ, which, by their bulk, keep the muscular fibres unduly stretched. Thus in the case of the heart we diminish the amount of fluid in the vascular system by bleeding, diuretics, or purgatives ; in a dilated colon we attempt to remove any accumulation by enemata or aperients, or in the case of the stomach by the employment of the pump. By so doing we allow the muscular fibres to contract, and thus place them in the most favorable condition to recover their tone.

F. When a muscle is incompletely supplied with blood its irritability is lessened, and it is, therefore, easy to see how important it is to maintain the general nutrition. This is more especially necessary in those instances in which, as sometimes happens, the dilatation has arisen, not from an obstruction to the egress of the contents, but from mere feebleness in the muscular fibres of the organ. These are the most favorable cases for treatment ; they require a long-continued and careful course of tonics, such as iron, zinc, quinine, or other vegetable or mineral remedies of this class. It is well known that a due supply of oxygen is essential to muscular contraction, and the lack of strength exhibited by anæmic persons affords an illustration of this physiological truth. It is probably by increasing the number of the red blood-corpuscles, and thereby assisting oxygenisation, that iron is so especially valuable in dilatation of the heart and other muscular organs. Where there is no anæmia you may have recourse to the salts of zinc or silver, or to some of the vegetable tonics.

H. It is evident that it cannot be sufficient merely to diminish the contents of a dilated organ, and to improve the state of the blood circulating through it, for the enfeebled fibres would still allow of a fresh accumulation before we had time to improve their nutrition by tonics. In every case, therefore, after having lessened or removed the contents, you should keep the organ as empty as possible by stimulating its fibres to contraction. It

is for this purpose you employ digitalis in heart disease—aloes and other aperients in a case of dilated colon. It is a common and very useful plan to combine the muscular stimulant with the tonic; thus perchloride of iron and digitalis form a favourite prescription for dilated heart, and sulphate of iron and aloes for a similar affection of the large intestine. As soon as you see the contractile power is improving you may lessen the amount of the stimulant, whilst you continue or increase that of the tonic. It is also useful to vary the tonic from time to time, so as to keep up the nutrition of the muscle, at the same time that you obviate any disorder of the digestive organs likely to arise from a too long continuance of the same drug.

We may sum up the indications for the treatment of a dilated organ as follows:

A. *Ascertain and, if possible, remove the cause.*

F. *You must direct your attention to the organs engaged in nutrition.*

a. Attention to diet.

b. Attention to the digestive organs.

c. Attention to the eliminating organs.

H. *It may be necessary to stimulate the muscular coat of the affected organ.*

4. *Indications for the Prevention of Spasm and Neuralgia.*

A. In order to prevent the occurrence of spasm every circumstance likely to provoke irritation must be removed. Thus in colic constipation should be prevented, and the greatest care taken as regards diet and the use of appropriate aperients. In false croup attention must be directed to the state of the gums and digestive canal. In general convulsions you should search for some source of irritation in the various organs, as the complaint often arises from distant and unsuspected causes. Whenever you have reason to suspect the patient has suffered from syphilis, it is useful to prescribe iodide of potassium, or some other drug believed to possess a specific power over that disease.

In the prevention of neuralgia never neglect to seek for a

source of irritation. The search, however, often requires to be both careful and minute. If a history of a former attack of ague or of gout can be discovered, you may often with great success employ the remedies required for these diseases.

F. The state of the nutritive organs is as important in the treatment of spasmodic as in that of any other chronic disease. In the prevention of neuralgia this point is one of especial value, for an anæmic condition is one of the chief predisposing causes of painful affections of the nerves. You ordinarily have to trust to tonics, alcohol, and a liberal diet. Preparations of iron, to increase the proportion of the blood-corpuscles, are regarded by many as the most valuable means for the prevention of this class of disorders.

H. *It is often necessary to stimulate or depress the functional activity of the nervous centres.*

It is probable that in a healthy state the brain inhibits, or at any rate controls, the reflex actions. If this organ is removed in a frog the susceptibility to them is greatly increased, and daily experience shows us that where cerebral exhaustion is present, the nervous system is more excitable than in health. It is, therefore, of great importance to attend to the nutrition of the nervous centres wherever there is a tendency to attacks of motor or sensory disturbance. For this purpose you may prescribe phosphorus, which is a constituent of nervous matter, and which may be administered in the pure state, or in some of its combinations. It acts most beneficially when given along with cod-liver oil. In other cases preparations of zinc or arsenic prove very beneficial. Where a direct stimulant is required nux vomica is most suitable.

In certain cases, such as epilepsy, the continued exhibition of sedatives, such as the bromide of potassium or belladonna, appears to ward off attacks of convulsions more certainly than tonic remedies.

We may sum up the indications for the prevention of spasm or neuralgia as follows:

A. *Ascertain and, if possible, remove the cause.*

F. *You must direct your attention to the organs engaged in nutrition.*

a. Attention to diet.

b. Attention to the digestive organs.

c. Attention to the eliminating organs.

H. *It may be necessary to stimulate or depress the functional activity of the nervous centres.*

CHAPTER IV.

DISEASES OF THE HEART AND PERICARDIUM.

You are able to increase or diminish the rapidity or the force of the heart's contractions, and thereby you can affect the condition of the circulation throughout the whole body.

The force with which a healthy heart contracts is, other things being equal, in proportion to the obstacle it has to overcome. By muscular exercise the blood is driven with greater rapidity through the vessels, the circulation is carried on more quickly, and consequently the action of the left ventricle is augmented. Whenever, therefore, you wish to diminish its force, you must insist upon perfect rest being given to the whole body. In like manner, since the right ventricle has to propel the blood through the lungs, and any difficulty of breathing retards the pulmonary circulation, the patient must be placed in such a position as will render the respiration most easy when it is necessary to quiet the action of the right side of the organ.

When the heart shows signs of failure in a disease unconnected with lung complication, the patient should be encouraged to rest with his head low, in order that the circulation in the brain may be maintained with as little cardiac exertion as possible. Where there is co-existing disease in the lungs, it may be necessary that the head should be raised. In most hospitals beds are provided, one end of which can be elevated to a convenient height. When these cannot be obtained a bed-chair must be used, or a temporary support may be made by placing an ordinary chair, turned upside down, at the head of the bed, and padding its hollow with pillows. The patient is apt to slide down when he is only propped up by pillows without a solid support behind them.

You can stimulate or depress the heart by means of medicines. The chief stimulants are ammonia, ether, chloroform, camphor, and alcohol. They are all rapidly eliminated from the system, and must be, therefore, administered in frequently repeated doses.

Ammonia is most useful when it is necessary quickly to arouse the heart to more vigorous contractions, as in cases of fainting from loss of blood or other causes. When you require an expectorant along with a stimulant, as in the bronchitis of old and feeble persons, the carbonate of ammonia is especially valuable. Where the failure of the heart is gradual, as in febrile diseases, ammonia is greatly inferior to alcohol.

Ether acts rapidly on the heart, and is especially valuable when, in addition to its stimulant properties, you require an expectorant or antispasmodic.

Camphor is chiefly employed in the exhaustion following febrile diseases, but is not of much value where failure of the heart occurs suddenly.

Alcohol is the most valuable cardiac stimulant we possess. It may be used in all febrile and exhausting diseases as soon as the signs of failure of the heart present themselves, and it should be given at an early period of acute disorders to the old and feeble. Its stimulant effects on the digestive organs especially fit it for any case where there is feebleness of the gastric functions. Wine is the best form in which you can prescribe alcohol, and it ought to be given along with food. Malt liquors are preferred in cases of anæmia,—for example, in females whose vascular system has been depleted by long-continued nursing, by leucorrhœa, or menorrhagia. Spirits are employed when it is desired quickly to arouse the heart's power, or where wine is unsuitable. The doses of alcoholic stimulants should be regulated, not only by the necessity for their use, but also by the previous habits of the patients. It is advisable not to prescribe alcohol without real necessity. Never order it merely to gratify the desire of the patient, nor permit its use for complaints of faintness or want of appetite, for you must remember that the recommendation of the physician is liable to be quoted as a sanction for its abuse. In certain cases the patient may be unable to swallow, or it may be necessary to

arouse the heart rapidly to vigorous action; under these circumstances you may use an enema containing brandy or turpentine, or you may inject subcutaneously one or two drachms of brandy, or thirty minims of ether, or two minims of liquor ammonii diluted with two or three times the quantity of water.

One of the best stimulants for sudden failure of the heart, and one that can be always readily obtained, is a bottle or india-rubber bag filled with hot water, or a hot mustard poultice, applied to the cardiac region.

There are certain substances which, although they do not act immediately on the heart, like the stimulants just mentioned, gradually increase the force of the muscular contractions of the organ. They are usually, therefore, regarded as cardiac tonics. Under this head we have digitalis, strophanthus, convallaria, caffein, and nux vomica.

Digitalis lessens the rapidity of the heart's action at the same time that it strengthens the ventricular contractions. It is, therefore, of most use in a dilated heart, when the pulse is rapid and irregular. As it is also a diuretic, it is especially fitted for cases where the amount of urine is diminished. It is, however, slow in its action, and as it does not, like alcohol, stimulate the nervous system, it is of comparatively little value in febrile and exhausting diseases. If it produce vomiting, or if the pulse become very slow, it should be suspended until these symptoms have passed away. Where it is necessary to give it for any length of time, it is advisable to omit it for a few days every two or three weeks.

Convallaria and strophanthus act like digitalis, but, according to our experience, are in most cases less certain in their effects. They are useful when digitalis disagrees with the digestion, or when that drug has been long continued and seems to be losing its power on the heart. Caffein is often of use in cardiac dropsy, and is best prescribed along with digitalis. Strychnine is usually administered by hypodermic injection, and is of considerable value in certain cases.

The chief depressors of the heart are bloodletting, purgatives, antimony, hydrocyanic acid, aconite, and veratrum viride. Formerly this class of remedies was as generally employed in all acute disorders as stimulants now are. Bloodletting is the

most prompt and efficient depressor of the heart we possess. It is now rarely prescribed for this purpose, excepting in certain forms of congestion and inflammation.

Tartrate of antimony is still a favourite remedy with many practitioners. It is most useful in the acute forms of bronchitis. In small doses it acts as a diaphoretic. In children's diseases it must be used with caution, and ought not to be given when there is any tendency to inflammation of the mucous membrane of the gastro-intestinal tract.

Hydrocyanic acid is rarely ordered, excepting in cases of hypertrophy of the heart attended with distressing palpitation.

Aconite is sometimes prescribed, instead of the tartrate of antimony, to reduce the force and rapidity of the heart's action. It must be used with caution in old persons, and should never be employed when the heart is dilated or otherwise feeble.

The veratrum viride has been much used in America, where it is preferred to aconite, as being more effectual and less apt to induce dangerous depression.

SECTION I.

Morbid States not necessarily Dependent on Organic Disease.

The action of the heart may be altered in various ways without organic disease being necessarily present, or the same alteration may occur along with very different anatomical changes. Thus the force with which it contracts may be increased or diminished, its rhythm may be perverted, or it may be the seat of spasmodic pain.

The contractile power is increased in hypertrophy, but, as you will shortly see, this condition takes place usually only in proportion to the amount of disease present in the blood-vessels or valves, conditions which most generally produce it.

Palpitation.

The most distressing increase in the action of the heart presents itself during an attack of what is termed palpitation. This may take place when the organ is either in a healthy or in a diseased condition. In the latter case it is most apt to occur when the patient has been subjected to physical or mental excitement. In the former it often comes on suddenly, and without any apparent cause. An attack may last only for a few minutes, or it may continue for days. In some instances it gradually subsides; in others it passes off in a moment, and the patient is at once restored to his usual state of health.

Prognosis.—You must first ascertain if there is any structural change in the organ that may account for its increased irritability. In case of organic disease the prognosis depends on its nature and degree; where there is no anatomical alteration the prognosis is favorable, although the attacks may frequently recur, and the restoration to health may be slow and tedious.

The indications *for the treatment during the attacks* are similar to those required for other acute nervous disorders.

Treatment during an Attack of Palpitation (p. 37).

A. Your efforts must be directed to discover and remove any condition that may have excited the increased action of the heart. If, for instance, you have reason to believe that it has arisen from acidity resulting from indigestion, you may prescribe liquor potassæ or magnesia, along with some carminative, such as peppermint or cinnamon water (F. 23). The alkaline carbonates may be used, but should be combined with ether, chloroform, or some other stimulant for the purpose of assisting in the expulsion of the carbonic acid evolved by their chemical decomposition. Where feculent accumulations seem to have been the exciting cause, a stimulating enema or a dose of some aperient medicine will afford relief (F. 148). When it has been produced by mental excitement you may prescribe bromide of potassium, hyoscyamus, or morphia, alone or in combination (F. 107).

C. In most cases sedatives, in some form or another, are required. In severe attacks you may employ morphine subcutaneously (one eighth or a quarter of a grain); in slighter ones you may trust to bromide of potassium, hyoscyamus, or chloral (F. 109). A combination of morphia, ether, and camphor is a favourite prescription with many practitioners (F. 174). Where the pulse is very rapid or the action of the heart irregular, small and frequent doses of digitalis are of most use (F. 78).

Where the symptoms are not very distressing a plaster of belladonna or opium often affords relief, or a liniment of chloroform and belladonna may be used over the heart (F. 195). Some foreign physicians speak highly of the use of cold evaporating lotions and of the ice-bag. The latter should be employed with caution if you have any reason to suspect extreme dilatation or fatty degeneration of the organ.

D. You must insist upon perfect rest. Let the patient remain in bed with the head raised, as the breathing is more easy in that position.

Treatment to prevent Attacks of Palpitation (p. 37).

A. You meet with two classes of cases of palpitation unattended by organic disease of the heart. One appears to arise from a disordered state of the digestion, acting upon a nervous system either naturally over-excitable, or whose excitability has been increased by gout, over-feeding, the abuse of alcohol, or some other cause. In such you must direct your attention entirely to the digestive and eliminating organs. You will find it an advantage to add to your ordinary remedies some sedative, such as hyoscyamus, conium, or small doses of morphine. Avoid severe purgatives, as patients in this condition are generally very susceptible to their action. You may lessen the irritability of the heart by placing a plaster of belladonna or opium over it. In old people attacks of palpitation are sometimes the precursor of the other symptoms of fatty heart, so that you must be careful not to depress the circulation when you have reason to suspect this to be the case. The second class occurs in persons affected with anæmia, however it may have been produced, or

in those whose nervous system has become enfeebled. Anæmia is the most common cause, and must be treated by some preparation of iron, a carefully regulated diet, exercise in the open air, and a moderate amount of alcoholic stimulants.

A slight irritation of any organ is sufficient to produce an attack; and you must, therefore, direct your efforts to improve the general health. In every case of palpitation you must insist upon your patient avoiding all circumstances likely to enfeeble the nervous system, such as an immoderate use of tea, coffee, or tobacco. See that he has sufficient sleep, and does not exhaust himself by study or other mental excitement.

F. Regulate the diet carefully, for indigestion in its slightest form is apt to bring on an attack of palpitation in those predisposed to it. Remember that in many the stomach is not so much in fault as the colon. If you find that mucus is habitually present in the evacuations, and that the motions are knotty, you will often be able to relieve your patient by attention to the functions of the large intestine alone (F. 158). In females you will perhaps be able to discover that the nervous system has been weakened by the long continuance of some discharge. Usually it is excessive menstruation or leucorrhœa that requires to be restrained, but in other instances there may be bleeding from piles or prolonged lactation.

H. Where you have reason to believe an enfeebled state of the nervous centres is present you may prescribe zinc, iron (F. 200), strychnine (F. 228), or cod-liver oil, supporting nutrition by means of a liberal diet and a moderate amount of alcohol. One of the most useful prescriptions for this purpose is a combination of valerianate of zinc, quinine, and rhubarb pill (F. 233). In some cases all tonics seem to increase the tendency to palpitation, and relief is obtained by a course of bromide of potassium combined with liquor potassæ (F. 10).

During an attack of palpitation.

Amer.—Give ether or chloroform, and, if not successful, add opium, or, in extreme cases, use morphia hypodermically. When it is obstinate small doses of aconite are often of use.

Fr.—If the pulse is feeble, digitalis is useful; in other cases prescribe bromide of potassium, musk, ether, or hydrocyanic acid.

Germ.—Ice-bag to the heart. Give bromide of ammonium or potassium, digitalis or hydrocyanic acid.

To prevent attacks of palpitation.

Amer.—If anæmia, give iron. Let the patient avoid tobacco, tea, and coffee.

Fr.—Let all food likely to produce flatulence be carefully avoided, also tea, coffee, and tobacco. Digitalis is very useful, and may be combined with sedatives, such as the bromides, or with stimulants.

Germ.—Treat the cause—anemia, hysteria, irregular menstruation, corpulence, &c.

Fainting.

One of the most important subjects in medical practice is the sudden or gradual failure of the power of the heart. Fainting is usually preceded by nausea, giddiness, pallor of the face, clammy perspiration, and a feeble pulse. An attack may have been the result of internal hæmorrhage caused by ulceration of the stomach or other important organ, or it may be simply the consequence of exhaustion arising from dyspepsia, diarrhœa, or in the female from excessive menstrual discharge or leucorrhœa. Some persons are, however, very liable to faintings from very trivial causes. In old people a tendency to attacks of this kind should lead you carefully to examine the state of the heart, lest fatty degeneration or valvular disease may be present. During the attack the patient should be placed in the horizontal position, with the head as low as possible, and a dose of alcohol or ammonia be administered, or cold water may be dashed upon the face or ammonia applied to the nostrils. You will sometimes be consulted for sudden attacks of fainting which are in reality slight fits of epilepsy. Inquire carefully into the family history, ascertain if the faintness ever takes place during the night, if it is preceded by nausea, giddiness, or pallor of the face, if the patient falls suddenly and has any twichings of the muscles, if the urine is passed involuntarily, or if he falls asleep after the attack has passed away. By attending to such points you will generally be able to arrive at a correct conclusion, and can direct your treatment accordingly.

Gradual Failure of the Heart's Power.

This is one of the most common causes of death in both acute and chronic diseases. As a free circulation of blood is necessary for the performance of the function of every organ, the ill effects of a weakened state of the heart rapidly show themselves. The nervous system becomes enfeebled, the circulation through the lungs embarrassed, the muscular power fails, and the patient is incapable of exertion. The indication to which you must chiefly trust is the state of the pulse, which becomes small and compressible, in proportion to the feebleness of the heart's contraction.

Failure of the heart may originate in different ways. 1. It may arise from a simple deficiency in the quantity of the blood, the contractile fibres being deprived of their due supply of nutriment; in this way it often occurs after hæmorrhage or wasting disorders, such as diarrhœa and dysentery, and as the result of fevers. 2. It may be caused by an abnormal state of the blood preventing the chemical changes that are necessary for the development of muscular action, as in diseased kidneys, pyæmia, and other like disorders. 3. It may result from alterations in the muscular structure itself—for instance, after inflammation of the heart, or in fatty degeneration. 4. Again, it may be the consequence of affections of the nervous system, as in certain forms of apoplexy. But in whatever manner failure of the power of the heart may arise, the organ is so necessary to life that you must at once direct your attention to it, and for the time should put aside all treatment that may interfere with this object.

Treatment.—Insist upon perfect rest, and, if not contra-indicated by other circumstances, let the head be kept low. This enables the heart to recruit its strength by reducing the expenditure of force to the smallest amount consistent with the continuance of life. Prescribe stimulants, with or without tonics, at frequent intervals. The best of these are ammonia (F. 70), alcohol, and ether (F. 72). If tonics are requisite you may use quinine, cinchona (F. 219), or iron. You may assist the action of the heart by external stimulants, such as poultices of mustard, stimulating liniments, and heat to the extremities. Be careful

to keep the room warm, and at an even temperature. Above all, see your patient is well supplied with food in a liquid and easily digestible form, such as hot soup, beef tea, milk, eggs, &c. It is a good plan to combine stimulants and nourishment, and the Mistura Spiritûs Vini Gallici is a valuable formula for this purpose.

Pain in the Cardiac Region.

This is a common complaint. It may be continuous or occur in paroxysms, one form of the latter being known as angina pectoris. In all cases have the clothes removed and carefully examine the part, for pain in this region may be produced, when recent, by herpes zoster, or, when of a chronic character, by a syphilitic node upon one of the ribs or costal cartilages.

Continuous pain is commonly referred to the fourth or fifth intercostal space. It may arise from different causes. For example, from pleurisy, from intercostal rheumatism, or in some cases from diseased heart. It is often caused by slight attacks of pleurisy in the early stage of phthisis, and you should therefore in all doubtful cases examine the state of the lungs with great care. It is much more rarely the effect of diseased heart than is generally supposed by unprofessional persons, but even where such an affection is present it often is the result of a co-existing derangement of the digestive organs. It may also be produced by disease of the spine, or by an aneurism pressing on the vertebræ. Under such circumstances there is pain on each side, although it may be more severe on one than the other. In the female the most general cause of intercostal neuralgia is dyspepsia arising from an affection of the colon, or irritation of the uterus or ovary. Of course you must in each case try to remove the cause of the pain, but you will often be able to afford temporary relief by the application of an opium or belladonna plaster, or by the use of a liniment of belladonna (F. 194), aconite (F. 191), or some other sedative to the painful part.

Angina Pectoris.

Prognosis.—The paroxysms vary greatly in frequency and severity. In some persons they occur only at long intervals, in others the slightest agitation or excitement suffices to induce them. They are always of dangerous import, and, as a rule, sooner or later terminate fatally, but it is rare for a first attack to produce death. If you fail to discover cardiac disease, examine carefully for evidence of aortic aneurism. You must, however, be on your guard not to confound with this affection a numbness of the left arm and fingers that arises from flatulence, and which may be readily cured by attention to the diet and regimen.

Treatment during an Attack (p. 27).

A. If you can discover any exciting cause, such as a recent meal of indigestible food, you had better act briskly on the bowels with a dose of calomel and colocynth (F. 165) or an enema. Where flatulence and acidity are prominent symptoms you may prescribe magnesia, soda, or potash, along with chloroform or peppermint water (F. 18, 23).

B. The pallor of the face and the feebleness of the pulse seem to show that there is a failure of the muscular power of the heart. When these signs are present you must give brandy, ammonia (F. 70), or ether (F. 72), and repeat the dose as often as seems necessary. If the pulse is intermittent you may combine digitalis in moderate doses with them. A large mustard poultice to the epigastrium often gives relief. Some prefer the use of hot fomentations to the region of the heart, whilst others trust to mustard foot-baths. The objection to the use of the bath is that it disturbs the patient, who is always anxious to remain perfectly at rest.

C. Relief of the agonising pain that accompanies the attacks is the most important indication, and opium is superior to any other drug for this purpose. You may inject a quarter of grain of morphia subcutaneously and repeat it if necessary. Others

prescribe forty minims of the tincture of opium along with thirty minims of the spirit of ether or with brandy. Before giving large and repeated doses of opium you should test the urine for albumen, and if this be present you must use the drug with great caution. Chloral has been recommended, but it is inferior to opium. In severe cases, or where the attacks recur frequently, the inhalation of chloroform and ether may be employed, but bear in mind that the former of these is very apt to depress the action of the heart, especially where fatty degeneration is present. Of late years the nitrite of amyl and nitro-glycerine have been much used, and generally with benefit. Two or three minims of the nitrite of amyl should be inhaled, and, if no ill effects are observable, the same dose may be repeated. Hermetically closed glass capsules are manufactured, containing a proper dose of this valuable remedy, which can be carried about by the patient. As soon as the symptoms of an attack are felt, a capsule may be broken and the drug inhaled at once. The usual dose of the nitro-glycerine is $\frac{1}{50}$ to $\frac{1}{200}$ gr. It may be given in the form of tabloids.

D. The patient instinctively remains at rest in the sitting position, and seems to dread the slightest muscular exertion. He should not be disturbed until the pain has completely passed away, as any movement is apt to give rise to a recurrence of the attack.

Treatment for the Prevention of Attacks of Angina Pectoris (p. 36).

A. The state of the digestive organs ought to be watched, and the diet carefully regulated. All severe mental or bodily exertion should be avoided ; the amount of exercise should be moderate, and walking shortly after food or on hilly ground must be prohibited.

H. A long course of arsenic or of valerianate of zinc in small doses is often of value. In many instances a long course of iodide of potassium proves extremely beneficial.

Nitro-glycerine may be administered either in the form of the tabloids ($\frac{1}{100}$ grain in each) or of the 1 per cent. solution of trinitrine. The nitrites of sodium and potassium are also

occasionally administered, but in the opinion of the author they are of inferior value to all other nitrite preparations, and are apt to induce great depression and vomiting. It is well, therefore, to commence with a small dose (gr. ½) and gradually to increase it while carefully watching its effects. In some cases the confidence produced in the mind of the patient by his having always at hand a sedative and antispasmodic draught appears to lessen the tendency to the attacks (F. 175). It is still more useful for him to carry in his pocket a few tablets of nitroglycerine or a small bottle containing some capsules of the nitrite of amyl.

SECTION II.

Acute Diseases of the Heart.

Acute Pericarditis.

Prognosis.—This disease usually runs its course in from ten to twenty days. The danger depends chiefly on the cause producing it, for there seems no reason to suppose that inflammation of the serous membrane covering the heart is necessarily attended with risk to the life of the patient. Idiopathic pericarditis is very rare; occasionally it results from accidents, but if the injury is slight it soon subsides. Its most common cause is acute rheumatism; it ordinarily shows itself early in the disease, and ends in recovery, but a sudden and high rise of temperature is a bad sign. In children choreic symptoms are very unfavorable.

Where it follows pleurisy the prognosis is generally good. On the contrary, when it occurs in persons affected with diseased kidneys or pyæmia it is almost always fatal. The danger from pericarditis usually arises from failure in the heart's power, from the pressure of the fluid embarrassing its motions, or from the inflammatory action having also affected the muscular structure.

Treatment (p. 29).—**A.** You usually persist in the treatment required for the disease that has produced the inflammation.

Thus you continue salicylate of soda or alkalies in acute rheumatism, quinine in pyæmia, and eliminating remedies in renal disease. The salicylates do not, however, appear to be so useful when rheumatism has attacked the pericardium as when the joints only are affected, and many practitioners therefore prefer the alkaline treatment (F. 16). Formerly mercury was always given in repeated doses so as to produce ptyalism, but it is now rarely used. Some authors advise digitalis from the onset of the disease.

B. The large bleedings formerly advised in pericarditis are now never practised, for they are useless in rheumatic cases, and injurious where the disease has arisen from pyæmia or renal disorders. Leeches are often of advantage in young and vigorous subjects in relieving pain and dyspnœa; they should be applied only in the early stage, and may be repeated if necessary. In all cases you may give relief by the employment of hot poultices and fomentations to the cardiac region. Some have recommended ice and cold lotions, but less comfort is obtained from them than from poulticing. In rheumatic cases, when the temperature is high, some practitioners prescribe small and repeated doses of the tincture of aconite (2 to 4 minims).

Whenever signs of failure of the heart are observed you must have recourse to alcohol or ammonia (F. 70), to which quinine or cinchona (F. 71) may be added if necessary.

C. In rheumatic cases you usually trust to opium to allay the excessive action of the heart and to alleviate pain. If there be no contra-indication, half a grain may be given every four hours, or morphia may be used subcutaneously. In kidney cases you should give it sparingly or withhold it. As the pain is generally trifling in pyæmia, and the heart is depressed, you seldom prescribe opium unless in combination with alcohol and other stimulants. A very high temperature, attended by delirium, requires the cold bath, as in ordinary cases of rheumatic fever. In those depending upon kidney disease the hot-air bath can be generally employed. In some cases the pain is intense, and yet the heart is too feeble to bear large doses of opium. Under such circumstances you may employ a liniment of chloroform and belladonna (F. 195), or sprinkle half a grain of morphia on a blistered surface over the heart.

D. In no disease is it more necessary to insist upon perfect rest. Let your patient remain in bed with the head raised, for fatal fainting not unfrequently follows attempts at muscular exertion. This is more especially necessary where the amount of liquid exudation is large; the sudden raising of the head under such circumstances being very apt to produce syncope.

E. The patient must be restricted to milk, beef-tea, and farinaceous food, unless signs of failure of the heart show themselves, when a more liberal diet should be given.

G. Usually the effusion is absorbed as soon as the inflammation subsides, but where absorption seems to go on slowly you may give digitalis, the iodide or acetate of potassium, or other diuretic remedies (F. 92). In rheumatic cases blisters seem to act well, but if the area of dulness remains large for some time, the iodine liniment may be painted over the heart, or a mercurial and iodine ointment systematically applied.

In some instances, where the heart has been oppressed by an unusual amount of effusion, the aspirator has been used, and the life of the patient apparently saved. The practitioner must, however, always convince himself that the failure of the heart is really due to the external pressure of the pericardial exudation, for it may be the result of endocarditis or of inflammation of the muscular structure. In other instances there is co-existing pleurisy with effusion, and the removal of the fluid from the chest is sufficient to afford relief to the circulation.

As regards the method of performing paracentesis of the pericardium, Walshe says "it should not be attempted unless the exploring trocar has given evidence of the presence of fluid within the sac."

"If the operation be determined on, the integuments should be incised at the upper angle of the fourth left interspace, or a little lower than this; a trocar should then be introduced cautiously into the distended sac perpendicularly to the surface, the patient lying in the recumbent position with the head moderately low." Roberts advises "aspiration in the fifth interspace just above the sixth rib, and about 2 to $2\frac{1}{4}$ inches to the left of the median line of the sternum. In a child it should be a little nearer the sternum. For mere exploratory

purposes the hypodermic syringe and needle will answer the purpose."

A. *Amer.*—Salicylates are of no use in rheumatic cases. It is better to use alkaline treatment.

B. *Amer.*—In robust subjects a few leeches. Poultices and hot applications are better than the ice-bag.

Fr.—If much pain a few leeches. If much oppression digitalis, which should be carefully watched. In rheumatic cases tartar emetic to produce diarrhœa and vomiting, but only in the early stage (Jaccoud). In a depressed condition alcohol, quinine, acetate of ammonia.

Germ.—In robust subjects leeches. Ice-bag very useful. If pulse rapid and small give digitalis, but watch its effects.

C. *Amer.*—Opium in early stages is of use.

Germ.—If patient restless give morphia.

D. *Amer., Fr., Germ.*—Absolute rest is necessary.

F. *Amer., Fr., Germ.*—Liquid diet in the early stage.

G. *Amer., Fr.*—When much effusion acetate of potassium and squills. In chronic cases iodide of potassium and blisters. All recommend tapping in *extreme* cases. In purulent effusion free incision with drainage.

Endocarditis.

Prognosis.—It is difficult to estimate the duration of this disease, for the local symptoms are usually slight, and the general symptoms are often masked by those arising from some other malady with which it is associated. In almost all cases it results from a general disorder; thus it is more common than pericarditis in rheumatic fever, and it occurs also in chorea, pyæmia, eruptive fevers, and other acute disorders. There is, as a rule, little immediate danger from the ordinary form of endocarditis, but its future consequences are most serious, as it gives rise to incompetence of the valves and to emboli.

The emboli consist either of vegetations caused by an exudation of lymph upon the valves, or of masses of fibrin which form on the surface of the endocardium when roughened by inflammation. These are apt to be swept away by the current, and the amount of danger arising from them depends partly on their size, and partly on the organ whose circulation may be obstructed by them. If, for example, a large cerebral vessel is suddenly blocked up you may have fatal apoplexy:

if the spleen is the seat of the embolism, there may be tenderness on pressure, enlargement of the organ, and periodical elevations of temperature, like attacks of ague; if the kidneys are implicated, blood and albuminous urine, and even dropsy, may result. Emboli are occasionally produced where there are no physical signs of endocarditis, for murmurs in the heart are only heard when the valves are affected; and if the endocardium covering the surface of the ventricle be the sole seat of the inflammation, ulceration may be present, with the formation of clots upon it, without any indication than can be discovered by the stethoscope.

There is a form of ulcerative endocarditis which has been named *malignant endocarditis.* It may occur as a primary disorder, but ordinarily it accompanies or follows acute rheumatism, scarlatina, puerperal fever, or pyæmia; it is often very difficult of diagnosis, and usually has a fatal termination. In one form it is ushered in with severe pains of the joints, rigors, and headache, which are quickly followed by delirium, rapid breathing, quick pulse, and high temperature. In another the patient is attacked with rigors, followed by a high temperature, which subsides in a few hours, but recurs daily, or every other day, like intermittent fever, the spleen being at the same time enlarged. In both cases embolism of various organs is found after death.

Treatment (p. 29).—**A.** You continue the treatment of the disease with which the inflammation of the endocardium is accompanied, whether this be acute rheumatism, chorea, or pyæmia. In rheumatic cases it is advisable to give frequent doses of alkalies, even if you continue the use of the salicylates.

B. Venesection and leeches, which were formerly recommended, are now never employed. As so much of the mischief produced by endocarditis arises from the deposition of fibrin, you might expect that one of your chief indications would be to lessen the amount of this substance in the blood. Bloodletting was formerly supposed to effect this object, but it is now known that it does not do so. Salines (F. 85), alkalies (F. 16), and the reduction of the heat of the body seem more likely to be useful, and may be employed if there are no contra-indica-

tions to their use. Any failure of the heart's power must be treated with stimulants along with digitalis.

In malignant endocarditis frequent doses of quinine are useful (3 to 5 grains), and should be continued for some time. In case the heart becomes feeble, alcohol and other stimulants must be resorted to.

C. There is seldom much pain, so that opium is not required, as in pericarditis. The sense of oppression, that in some cases is so distressing to the patient, may be relieved by hot fomentations and poultices.

D. Insist upon perfect rest, but allow the patient to choose the position most agreeable to himself. He should not leave his bed until some time after all symptoms of the disease have disappeared. By this means you lessen the strain upon the inflamed valves, and thus allow the structures to regain as far as possible their normal condition.

E. The diet should consist of liquids as long as febrile symptoms persist.

G. The treatment of embolism depends upon the organ affected, since we have no remedies capable of dissolving a plug that has become impacted in an artery. In time it may be absorbed, and in that case, unless the obstructed vessel is of large size, and the parts around it are diseased, recovery may take place. Where, however, an important organ, like the brain, is the seat of the injury, permanent alteration of structure generally follows. When the main artery of a limb is obstructed, it should be placed in a state of perfect rest. The circulation should be assisted by gentle friction, and the limb should be wrapped in flannel or cotton-wool to maintain the heat. If the pain is severe, morphia, or some other sedative, must be given in frequent doses.

A. *Fr.*—Treatment same as in pericarditis.

Germ.—In rheumatic cases salicylic acid is almost powerless. In septic cases alcohol, quinine, or iron must be given.

B. *Amer.*—If much pain a few leeches. Flannel to the heart's region.

Germ.—If the action of heart is much excited, use an ice-bag over it; if the action is irregular, digitalis; if feeble, ammonia, camphor, alcohol, or ether; if dyspnœa and oppression, mustard plasters, small doses of morphia, or local bloodletting.

C. *Amer.*—Small doses of opium if necessary to procure rest.

D. *Amer., Fr., Germ.*—As complete rest as possible.

G. *Fr.*—Small doses of tartar emetic to favour absorption of exudation; if it cannot be borne use alkalies. Blisters of service over the heart (Jaccoud).

Hypertrophy of the Heart.

Prognosis.—This is always a chronic disorder, and generally arises from increased muscular action required to overcome some obstruction in the circulation. It is therefore, it most cases, scarcely to be called a disease, and may be looked upon as a friend rather than a foe to the patient. In rare cases it becomes dangerous, when, from some mental or physical excitement, the action of the heart is suddenly and greatly augmented. Under such circumstances, the vascular tension may be increased to such an extent that one of the vessels of the brain may be ruptured, and apoplexy produced.

Treatment.—It is rarely necessary to treat hypertrophy, excepting to relieve symptoms that may be distressing to the patient. You are generally consulted either on account of palpitation or dyspnœa. The palpitation seldom comes on in paroxysms, as when it arises from nervous derangement, but is troublesome after any unusual exertion or excitement. You will often be able to relieve this symptom by directing the patient to wear a belladonna or opium plaster over the heart. Where the patient is plethoric, the occasional application of a few leeches to the cardiac region often affords relief, but you must never push this, or in fact any depressing treatment, so far as to produce anæmia, lest fatty degeneration of the muscular structure should be induced.

The diet should be carefully regulated, small quantities of food only being allowed at each meal, and alcohol must be forbidden. Tea, coffee, and tobacco should be used in very moderate quantities.

The bowels must be freely opened, and an occasional dose of calomel or blue pill is often of great service (F. 160). In nervous persons the palpitation may be relieved by the use of some sedative, such as bromide of potassium, hyoscyamus, or hydrocyanic acid (F. 176), in combination with alkalies. Many practitioners seek to lessen the power of the heart by means of

aconite (F. 68) or veratrum viride. The two latter should be given with caution, lest the organ become too much enfeebled. Small doses of digitalis are recommended by some, but this drug is seldom of much value where hypertrophy is in excess of dilatation. If you have reason to suspect that fatty degeneration has taken place tonics should be prescribed. In all cases mental quietude is of the utmost value. Exercise may be taken in moderation, but all severe exertion or fatigue should be carefully avoided.

Amer.—Great moderation in eating, drinking, and exercise. When symptoms indicate cerebral congestion, use cathartics. Small doses of digitalis may be prescribed for palpitation; aconite and veratrum reduce the action of the heart.

Fr.—V. S. when there are symptoms of congestion of the brain or lungs, and the patient is robust; in feeble subjects cathartics or diuretics. Hydrocyanic acid and bromide of potassium quiet the action of the heart. Ice-bags are very useful. When there is no valvular disease, digitalis is contra-indicated. Iodide of potassium and blisters of value.

Germ.—Strict moderation in diet. Treatment chiefly required in idiopathic hypertrophy. Tincture of veratrum should be used with great caution. Tartar emetic has been recommended, but is not of much value. Ice-bags over the heart and small doses of digitalis are very useful in case of palpitation.

Dilatation of the Heart.

Prognosis.—Dilatation is the most important of the diseases of the heart, because most of the other affections are dangerous only when they have become complicated with it. As a general rule, dilatation begins and progresses slowly, but occasionally its course is rapid, and not more than two or three weeks elapse between the onset of dangerous symptoms and the time when the patient believed himself to be in perfect health.

The prognosis is favorable in proportion to the amount of hypertrophy that accompanies it; for as the ill effects of dilatation arise from the imperfect propulsion of the heart's contents, so an increased strength of the walls is capable of compensating, to a certain extent, for an enlarged capacity of the cardiac chambers. The prospect is also more favorable when the left side is alone affected, as the pressure on the veins

is then limited to the pulmonary circulation. As soon as the right side becomes also dilated, a backward pressure is exerted on the blood-vessels of all the organs of the body, and their functions are seriously impaired. In persons belonging to the richer classes of society a moderate amount of dilatation of the heart may exist for many years without much serious detriment to the health; but amongst the poor, whose strength is apt to be depressed by want, exposure, or excesses, the cases are more rapidly hurried to a fatal termination. Dropsy is an unfavorable sign, for, although it may be removed by medical aid, it shows that the balance of the circulation has been destroyed, and it is therefore very liable to recur. Hæmoptysis, in like manner, is a serious symptom, as proving that an important organ has become greatly congested or inflamed.

For the same reason, enlargement of the liver and albuminous urine are signs of dangerous import. Irregularity and intermission of the pulse are ill omens, as pointing to a serious loss of strength in the muscular power of the heart. You must not, however, forget that intermission of the pulse is habitual with some healthy persons, and may exist for a lifetime without any disease of the cardiac structures.

Treatment (p. 34).—Patients will frequently consult you for some trifling affection, in whom physical examination reveals, to your surprise, dilatation of the heart. In such the ill effects of the enlarged heart are prevented by the accompanying hypertrophy, and so long as the organ is able to perform its work you need not interfere. But you must bear in mind that these persons may at any time become the subjects of an increase of the dilatation, and therefore you should advise them to avoid excessive bodily or mental exertion, and any other circumstance likely to lessen the tone of the heart's walls.

A. In most cases you are incapable of discovering any cause that can be removed, and you must therefore try to prevent the circumstances that are likely to increase or maintain the dilatation, viz. plethora of the vascular system, or loss of tone in the muscular structure of the organ.

You would naturally think that venesection would be the best method of reducing the contents of the vascular system. But you must remember that every muscle must be freely supplied

with blood to enable it to contract with due force, and we therefore find that abstraction of blood promotes a tendency to dilatation.

F. In order to reduce the vascular contents it is better that you should direct your patient to eat sparingly, and to avoid much liquid food, such as soup, milk, malt liquors, &c. The occasional use of diuretics and of hydragogue cathartics will greatly assist you in meeting this indication.

H. Digitalis is the best tonic in all cases of dilated heart, and at the same time, by its diuretic action, it assists in reducing the amount of fluid in the vascular system. If there are no dangerous symptoms, you may prescribe it in moderate doses for a week or two at a time, merely as a heart tonic (F. 79), but when any complications arise it must be used more freely. The greater the feebleness of the heart the more useful is this invaluable medicine.

So long as dilatation is in excess of hypertrophy your aim must be to increase the tone of the muscular walls of the heart. In almost every case, therefore, you will find it an advantage from time to time to prescribe iron (F. 77), strychnine (F. 79), quinine (F. 78), or some other tonic, with or without digitalis, in order to improve the nutrition of the organ. When iron is unsuitable, arsenic is often of great value, but it should be given in small doses and for a length of time. As regards exercise, if there be no contra-indicating circumstance, let the patient take it regularly and systematically, carefully avoiding all fatigue, hurry, or excitement.

You are often not consulted until venous congestion of some organ has made its appearance. This may affect either the pulmonary or the general circulation.

Difficulty of breathing is the prominent symptom of which the patient complains when the lungs are overloaded with blood. But you should remember that dyspnœa in persons suffering from heart disease may be due, not only to congestion, but also to bronchitis, to effusion of fluid into the pleuræ or pulmonary textures, and to spasm of the bronchial tubes. You must first ascertain from which of these causes it arises. If from œdema, you have watery expectoration and fine crepitations at the bases of the lungs; there is dulness on percussion,

with feebleness of respiration and tactile fremitus, when hydrothorax is present. You treat œdema of the lungs as you would a dropsical effusion affecting the limbs, with diuretics (F. 91) and hydragogue cathartics.

When the dyspnœa is of a spasmodic character it occurs, or is much increased, at certain times, especially at night. You can hear sonorous and sibilant râles, the expectoration is neither watery nor stained with blood, and there is no dulness on percussion. Such cases are relieved by sedatives combined with antispasmodics, or by the subcutaneous injection of morphia. When there is bronchitis without asthma, as is often the case in dilatation confined to the left side of the heart, you must treat it on general principles, bearing in mind the necessity of depleting the circulation by means of diuretics, and of maintaining the tone of the muscular walls with digitalis. Most of these, however, require stimulants and expectorants, so that a mixture containing carbonate of ammonia, ether, and digitalis usually meets the requirements of the case (F. 74).

The most serious and difficult case you have to treat is where there is *acute congestion of the lungs*, associated with dilatation of both sides of the heart. Here the expectoration is often bloody, and there is dulness on percussion with fine crepitations at the bases of the lungs. The heart's action is also rapid, often irregular and intermittent. In many cases the congestion is produced by embolism of the pulmonary arteries resulting from clots detached from the right side of the heart. The indications are the same as for acute inflammation. When there is much hæmorrhage, the young practitioner is often tempted to use astringents for the purpose of checking it. This is a mistake, for the bleeding is caused by the pulmonary congestion, and is useful in relieving the overloaded condition of the vessels.

A. The cause being the overloaded state of the heart, you must prescribe digitalis (F. 90), with other diuretics, in order to deplete the circulation, whilst you give tone to the cardiac walls. Where the right side of the heart is much dilated, the liver enlarged, and the urine scanty, you will find the addition of mercury of great value (F. 99). In the slighter cases this treatment will be sufficient to afford relief.

B. It is in severe cases of this nature that you may expect benefit from venesection. Blood should be taken if the dyspnœa is very severe, the face of the patient blue, and the whole venous system greatly engorged. You should, however, abstract no more than is requisite to afford relief; generally six or eight ounces are sufficient. It is better to repeat the bleeding than to draw away a large quantity at once, lest you enfeeble the heart and increase the tendency to dropsy. The more recent the congestion the greater is the relief from venesection. It succeeds best in obstructive mitral disease, and is rarely of any service in regurgitation through the aortic valves. At the same time you withdraw blood you may stimulate the heart by means of alcohol, ammonia (F. 76), or ether. The present tendency of medical practice is, however, to abuse stimulants, and to neglect the diminution of the quantity of blood that is unable to travel through the obstructed pulmonary circulation. In children or feeble persons you may apply leeches, and, if bloodletting seems not to be desirable, you may give relief by dry cupping.

C. The loss of sleep is often very distressing; not unfrequently delirium is present. Now the question arises, Should you give sedatives? In a case of acute pulmonary congestion or of hydrothorax it is always a doubtful measure, for the lungs are apt to become more overloaded with blood when the excitability of the respiratory centre is lessened by narcotics, and the forced efforts at inspiration thereby diminished. When the dyspnœa is of a spasmodic character, and comes on chiefly at night, a sedative often gives great relief, and enables the patient to pass through the day with comfort. Where you think it advisable to give sedatives you will find bromide of potassium (F. 177), hyoscyamus (F. 185), or Indian hemp the best; or you may prescribe sulphonal (ten to twenty grains) or paraldehyde (thirty to sixty mins.).

D. You must keep your patient at rest. He will generally prefer the erect posture. Let him be well propped up, so that no muscular effort is required to enable him to maintain his position.

The indications for the *treatment of cardiac dropsy* are the same as those required for other forms of this condition (p. 32).

A. First ascertain if there is albumen in the urine, as the co-existence of disease of the kidneys will greatly interfere with the success of your remedies. Œdema of the legs often remains in a slight degree, from a loss of the elasticity of the skin after the dropsy has been removed. Where such seems to be the case bandages are of value. In the later stages the swelling may result from the anæmia produced by the remedies you have employed, and when you suspect this you must prescribe iron (F. 200), quinine (F. 215), and a liberal diet.

F. Where the kidneys are not greatly implicated, digitalis is by far the best diuretic. It may be combined with the acetate or acid tartrate of potassium, or other remedies (F. 90).

The infusion of digitalis acts more quickly than the tincture, but the latter is the more useful preparation when the drug has to be taken for a length of time. Sometimes digitalis produces vomiting, giddiness, and a tendency to fainting, and in such a case it must be discontinued, but since these symptoms are usually preceded by a slow and lingering pulse, it is wise to omit it as soon as this is observed. You may then apply flannels soaked in a hot infusion of the leaves of digitalis (four times the strength of the Pharmacopœia infusion) to the loins, so as to produce diuresis without affecting the heart. When digitalis loses its power, it may be combined with the citrate of caffein (two to eight grains), but the effect of caffein on the kidneys is seldom of long continuance. Belladonna sometimes acts as a diuretic and heart tonic, and may be tried when digitalis is unsuitable.

Convallaria (five to twenty minims of the tincture) and strophanthus (two to ten minims of the tincture) are often used as substitutes for digitalis, but they are inferior to it as diuretics. The strophanthus has, in our experience, proved of more value than convallaria, and, as it is said to have no cumulative tendency, it may be continued for a length of time. Whenever the liver is enlarged or the right side of the heart is dilated, mercury is the best diuretic, and may be given along with squills and digitalis (F. 99). If you are unwilling to give it internally, an equally beneficial effect can be produced by the rubbing of mercurial ointment over the hepatic region twice or thrice a day until the gums become sore. The presence of albumen in the

urine is not a contra-indication to the use of mercury in dilatation of the heart, unless you have reason to believe there is also atrophy of the kidneys. In some cases all diuretics fail on account of these organs being congested, and, under such circumstances, dry cupping to the loins often assists their action. In other instances the use of alcohol, in the shape of whisky or gin, will prove beneficial.

There is an objection to the use of hydragogue cathartics, on account of their action causing so much disturbance of the position of the patient; but where the urine is albuminous and the kidneys fail to respond to diuretics they must be prescribed. The compound powder of jalap (in drachm doses), or combined with gamboge (F. 168), is one of the most reliable ; but in other cases you may employ elaterium (F. 169). Care must be taken in the use of these remedies when there is aortic regurgitation, lest they should cause fainting, or increase, by the feebleness they produce, the dilatation of the ventricle. You seldom get much advantage from acting on the skin.

Where diuretics and purgatives are insufficient to relieve, you may puncture the skin of a dropsical limb so as to allow the fluid to escape. This operation generally succeeds better than where disease of the kidneys is the cause of the dropsy. The punctures may be made with a common needle, the surface being previously smeared over with oil containing carbolic acid, and the limb being afterwards laid upon flannels, into which the fluid is allowed to soak. Some prefer a fine cannula (Southey's tube), which is inserted into the leg and allowed to remain in the cellular tissue, the fluid being conducted to a basin placed near the bed by a fine india-rubber tube attached to it. It is not advisable to tap the peritoneum in cases of dilated heart, as the patient is very apt to sink after the fluid is removed. Hydropericardium, which so often accompanies cardiac disease, requires no special treatment. When the fluid in dropsy is rapidly removed the patient may feel excessively feeble, and dangerous and even fatal faintings may result. In such cases you must give stimulants freely, and insist on perfect rest in the recumbent position.

Amer.—Digitalis most useful, but if it disagree caffein and convallaria may be given. It is best to avoid digitalis in mitral stenosis. In

heart failure, alcohol, ether, and ammonia. In severe cases ether may be given hypodermically.

Fr.—Digitalis should be given where pulse is irregular and intermittent, but must be omitted if it makes the pulse very slow or produces vomiting.

Germ.—Digitalis whenever the impulse of heart is feeble, the pulse weak, irregular, or intermittent. It answers best in the form of powder. If it produce bad effects prescribe caffein or a cup of strong coffee. Sometimes it acts well when given as an enema, where it cannot be borne when given by the mouth.

Cardiac Dropsy.

Amer.—When diuretics are given the loins should be dry cupped or hot poultices applied over the kidneys. The compound powder of jalap, combined with calomel, is the most useful purgative, whilst digitalis, squill, acid tartrate of potassium, acetate of potassium, and caffein are most valuable as diuretics.

Fr.—In some cases of œdema Jaccoud advises, in preference to punctures, that forty to fifty drops of croton oil be rubbed gently on the limbs, to be repeated in two or three days until the characteristic pustules appear. The fluid will be evacuated through the sores so produced.

Diseased Valves.

Prognosis.—Students make great mistakes in their estimation of the danger connected with anatomical changes in the cardiac valves. They often expect that speedy, perhaps sudden death will be a necessary consequence of the lesions which the stethoscope reveals to them. The importance of an alteration in the structure of a valve depends entirely upon the changes it may induce in the walls of the heart, for if no dilatation results we need not dread it, however loud the murmur may be. In every case, then, before committing yourself to a prognosis, ascertain if the cavities are dilated, and if any signs of venous obstruction can be discovered. As a general rule, the systolic are of less consequence than the diastolic or pre-systolic murmurs, the former being often the result of anæmia, the latter being always of organic origin.

Mitral systolic murmurs may be present for many years without any deterioration of the general health. Mitral pre-systolic

murmurs are of shorter duration, and sooner or later become associated with symptoms of congestion of the lungs and dilated heart. The aortic systolic is of the least significance of all the heart murmurs, as in many cases it results only from anæmia. Diastolic aortic murmurs, on the contrary, sooner or later are accompanied by alterations in the size of the heart; you estimate the amount of disease, not by the loudness of the sound, but by the alteration of the pulse. I have, however, known patients with this murmur go through their ordinary duties for many years. The murmurs of the right side of the heart, excepting the *direct pulmonic*, are always dangerous.

Treatment.—The management of a valvular lesion entirely depends on the condition of the walls of the heart. You must first inquire whether there is dilatation, and, if so, if there is a sufficient amount of hypertrophy to compensate for it. In case there is no dilatation, or if there is a sufficient thickening of the walls to compensate for the increased size of the cavities, there is no ground for your interference, however loud may be the sound you hear by the stethoscope. There are, however, certain symptoms connected with disease of each valve you will be called upon to relieve.

Persons with mitral regurgitation often suffer from bronchitis, caused by the backward pressure of the blood in the pulmonary veins, when no other ill effects are produced. In such cases you treat the bronchitis on general principles, excepting that you bear in mind the necessity of maintaining the tone of the heart by means of digitalis, and keeping the quantity of the circulating fluid as small as possible by diuretics. In diastolic aortic disease one of the most distressing symptoms is a severe cramping pain across the chest and arms, like angina pectoris, coming on after exertion or during the night. The patient ought to wear a belladonna or opiate plaster over the heart. Do not in the early stage give digitalis, as it lengthens the diastole of the heart, and thereby lengthens the time during which the blood streams back into the ventricle. Belladonna is often valuable in relieving the pain or discomfort from which the patient suffers, and in most instances quinine and strychnine are of use, by improving the general health. Where there is much anæmia iron may be employed with benefit. At a later period,

when the right side of the heart has become dilated, you may use digitalis with decided advantage, and should combine it with ammonia or ether to maintain the force of the heart's action.

Ergot, in combination with quinine, often seems to relieve the tendency to angina: in most cases, however, you will find more benefit from small doses of morphine and ether. The attacks at night are especially difficult to alleviate; they seem to depend on an accumulation of flatus, and the pain generally passes away as soon as this can be expelled. You will find it a good plan to make the patient dine in the middle of the day, to eat sparingly, to take only a very light supper, to keep the bowels open by a carminative and aperient draught (F. 140), and to obviate the tendency to flatulence by appropriate measures. Be careful to avoid severe, and especially saline purgatives. A cup of coffee or soup should be kept hot during the night, and taken as soon as the pain comes on. In the later stages the patient is apt to suffer from frequent and severe attacks of angina, which are best treated by subcutaneous injections of morphine, or the inhalation of nitrite of amyl, or the use of nitro-glycerine. In some instances, when the attacks are very severe, relief is afforded by a subcutaneous injection of nitro-glycerine ($\frac{1}{100}$ gr.), with or without the addition of morphine.

Compensated Valvular Disease.

Amer.—The treatment must be hygienic. Food should be taken in moderate quantities; and vegetables, sweets, or fats should be sparingly used. A large quantity of liquids must be forbidden. All severe exertion should be avoided. If the appetite fails, give vegetable bitters, and let the bowels be regulated. If the patient is anæmic, prescribe iron.

Germ.—No drugs are required, and the use of arsenic, antimony, or of nitrate of silver is of no value. The excessive use of alcohol, coffee, or tobacco should be forbidden. The patient ought to sleep with the head low when there is regurgitation through the aortic valves.

In imperfectly compensated disease of the aortic valves.

Amer.—In aortic regurgitation give digitalis and iron. Digitalis can be safely given so long as it acts as a diuretic. If the patient is anæmic, give iron. If vertigo or syncope is liable to occur, prescribe quinine or

strychnine. Senega and ammonia often afford relief. Let the patient avoid alcohol, coffee, strong tea, and tobacco.

Germ.—Use digitalis when the pulse is small with increased frequency and low tension. It is best given in powder, and should be used cautiously. Caffein and convallaria may be prescribed when digitalis is contra-indicated.

Amer.—Severe attacks of pain are best relieved by morphia and nitrite of amyl.

Germ.—Morphia should be used to relieve pain, and is best given subcutaneously. Palpitation can be checked by the application of an ice-bag.

SECTION IV.

Aneurism of the Aorta.

Prognosis.—This is always unfavorable. The duration of the disease varies greatly, according to the position of the aneurism. Its course is more rapid when its walls are in contact with the trachea or œsophagus than where they are strengthened by the external framework of the chest. In the former case only a few months may elapse from the first symptoms to the fatal termination; in the latter, death may be postponed for some years.

Treatment.—Various plans have been proposed for the cure of aortic aneurism. Where the sac is situated in the abdomen, at a part which admits of pressure being made above it, a cure can be effected by compression of the artery. Pressure on the distal side of an abdominal aneurism has been practised, but hitherto unsuccessfully. Various methods have been employed to promote the coagulation of the blood in the sac. Needles have been passed into it, and a galvanic current directed through them. A solution of perchloride of iron has been injected, but with unfavorable results. Some have practised the subcutaneous injection of ergotine over the tumour, on the supposition that the muscular structure of the artery might be thereby contracted, but this has also ended in failure. Finally, fine silver wire has been inserted into the aneurism, in order that the fibrin might collect around it, but in each case thus treated a fatal result has ensued.

As all efforts at a radical cure of the tumour have hitherto failed, we are recommended to keep the patient as much at rest as possible, so as to lessen the action of the heart. This is more especially necessary where the sac presses upon important structures. The diet should be of an unstimulating character, consisting of milk, vegetables, fruit, bread, and a small proportion of meat; only moderate quantities of food being allowed at each meal. It has been proposed to lessen the action of the heart by digitalis, aconite, and veratrum, but no benefit has resulted from this plan. The acetate of lead, tannic acid, alum, and other astringents have also been employed, on the supposition that they might coagulate the blood in the sac, but no good results have followed their use.

For the relief of pain a few leeches may be occasionally applied over the tumour, followed by poultices, if the sac is still at a considerable depth from the surface; but when superficial an ice-bag is of more value.

I have sometimes prescribed venesection to a moderate amount when other means have failed to allay the pain. Some practitioners are in the habit of applying cold poultices of oak-bark to the tumour, and have reported in favour of the proceeding.

When palpitation is troublesome, you may control it by the application of a belladonna or opiate plaster, along with the internal administration of belladonna, aconite, or hydrocyanic acid. The bowels should be regulated by means of a mild aperient, and diuretics are required if œdema of the legs should occur.

Throughout the whole case you may have to employ sedatives, the subcutaneous injection of morphine being the most useful. A long course of iodide of potassium generally relieves the patient's sufferings, especially when you have reason to believe the complaint is of syphilitic origin, but it should be given in considerable doses (ten to thirty grains, three times a day).

CHAPTER V.

DISEASES OF THE LARYNX.

Various medicines can be applied directly to the mucous membrane of the air-passages with great advantage. This may be effected by means of a brush, by inhalers, or by instruments that disperse medicated fluids in the shape of spray.

The simplest form of inhaler is a jar with a narrow mouth, in which the medicinal substance is placed, together with some hot water. The patient inhales the steam as it arises, his head being covered with a cloth that falls over and envelops the jar. Various improvements on this have been contrived. Thus, Corbyn's inhaler (Fig. 1) consists of a jar fitted with a mouth-

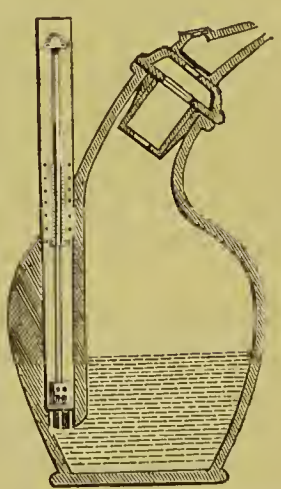


Fig. 1.—Corbyn's Inhaler.

piece, the temperature of the water being indicated by a thermometer. In some cases the medicine is dropped upon a sponge instead of being simply mixed with the hot water. Some inhalers are supplied with a spirit-lamp, so that the heat of the fluid can be readily maintained at the same temperature. The

best heat for the water is from 120° to 150°. It is a good plan to commence at 120°, and gradually to increase the warmth as the patient becomes accustomed to its use.

The substances ordered in the British Pharmacopœia for inhalation, with which hot water is used, are iodine, creasote, conium, and the oil of the Pinus sylvestris; hydrocyanic acid and chlorine are employed mixed with cold water.

Many drugs can be used in the form of spray which cannot be employed by inhalation. In the various kinds of nebulizers the medicinal solution is driven through a minute tube, and dispersed in the shape of spray. In one apparatus the current of air is set in motion by the compression of an india-rubber ball (see Fig. 2), but the spray thus produced is seldom

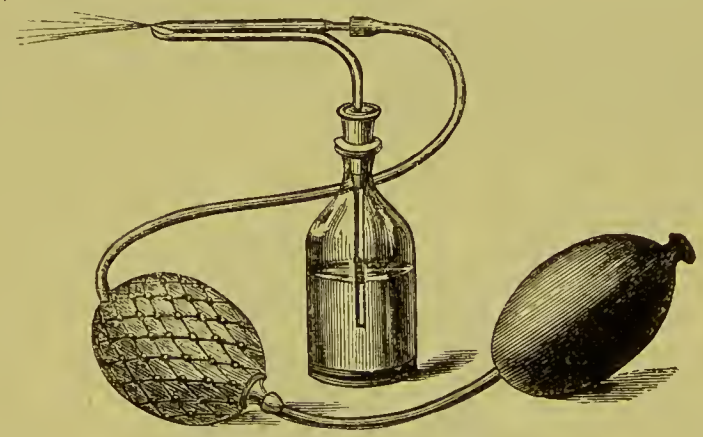


Fig. 2.—India-rubber Nebulizer.

capable of penetrating below the larynx. It is very convenient when you wish to apply your remedies to the nose, throat, or larynx, but is of little use in bronchitis.

In Siegle's apparatus (see Fig. 3) steam is employed, and the force with which the fluid is propelled is sufficient to carry it into the bronchial tubes. The following remarks by Cohen are worthy of attention:—"The materials used should be chemically pure, and the solution should be well filtered before using, in order that no sediment may accumulate to clog up the aperture through which the fine stream of fluid is forced. It is best always to begin with as weak a solution as will suit the case, the substance employed to be selected with reference to

its physiological and therapeutic influence on the constitution, as well as for its topical effect. The absorptive power of the mucous membrane of the respiratory organs being much greater than that of the stomach, poisonous substances must be employed with great caution, and their doses be augmented very gradually. The strength of any solution to be employed will vary with the individuality of the patient, his distance from the instrument, the length of the sitting, and similar considerations."

When the quantity of the secretion of the part is deficient, alkaline solutions should be used, such as the chloride of ammonium, bicarbonate of sodium, or iodide of potassium, in the proportion of five grains to an ounce of water. The hand-ball is better fitted for such cases than the steam nebulizer. If the amount of secretion is excessive, alum (five grains), sulphate of zinc (two grains), acetate of lead (two grains), or nitrate of silver (half a grain to the ounce of water) may be employed. The best

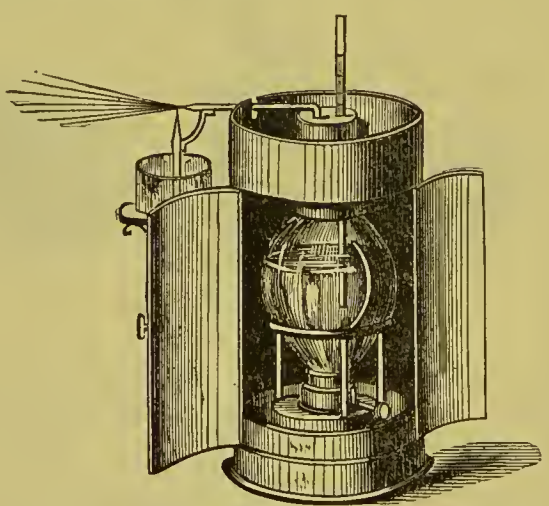


FIG. 3.—Siegle's Steam Nebulizer.

time for the use of an inhaler is shortly before a meal; the inhalations should be made slowly (about six in a minute), and should not be continued, especially at first, more than a few minutes. After a hot inhalation the patient should remain in the house for an hour or two, in order to prevent any bad effects that might arise from exposure to the cold air.

Besides the employment of medicines in the shape of inhalations and sprays, remedies can be directly applied to the larynx by means of a properly curved brush (see Fig. 4). You will find that considerable practice is necessary before you can acquire the requisite dexterity. These local remedies can be

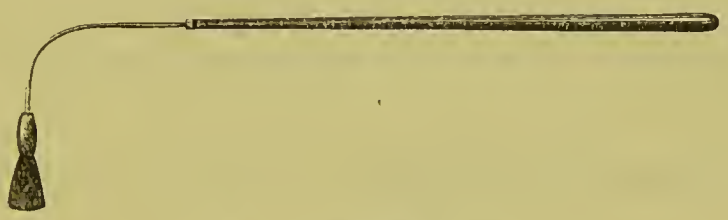


Fig. 4.—Laryngeal Brush.

best used with the aid of the laryngoscope in the following manner:—"The laryngeal mirror being held in the left hand, and a camel-hair brush (fixed to a slender rod of albuminium at an angle of about 95° or 100°, and fastened in a wooden handle) in the right hand. Those who do not employ the laryngoscope should hold the patient's tongue well out, in such a position that the posterior wall of the pharynx can be seen, and should then pass the brush down between the latter and the base of the tongue. The old method of pressing down the tongue with a spatula and using a flexible sponge probang could only end in failure."* As spasm is apt to be excited in the larynx of a person who has not been accustomed to the use of the brush, it is advisable always to begin with a weak solution of any drug you may wish to employ. Pain, or great irritability of the larynx or the neighbouring mucous membrane, can be often relieved by the application of the hydrochlorate of cocaine (2 per cent. solution) or of a solution of morphine (2 to 4 per cent. solution).

In diseases both of the lungs and larynx a perforated zinc respirator is often worn with great advantage, a few drops of some volatile fluid having been previously dropped upon the sponge.

"By a very simple contrivance the electric current can be applied directly to the local cords. The important feature in the laryngeal galvaniser is that the current does not pass beyond the

* Sir M. Mackenzie, in 'Reynolds' System of Medicine.'

handle till the sponge is in contact with the vocal cords. The instrument is held in the hand between the thumb and second finger, and when the sponge is in contact with the vocal cords the operator with his index finger presses on the spring of the handle, and the electric current passes through the larynx to the skin externally. By placing the sponge of the galvaniser on the arytænoid cartilages both branches of the pneumogastric nerve are stimulated (see Fig. 5). Its employment is indicated in func-

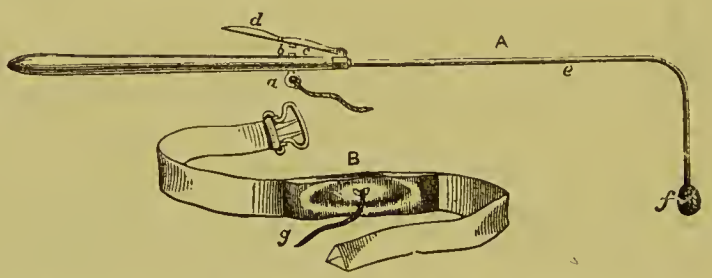


FIG. 5.—Galvaniser and Necklet. A. The laryngeal galvaniser. *a*, a metal ring, by which the galvaniser is connected by a chain either with a battery or a magneto-electric machine; *b*, the extremity of a wire communicating with *a*; *c*, metal point which, when the ivory handle *d* is pressed upon, touches *b*. The current then passes along the wire *e* (which is insulated in caoutchouc) to the sponge *f*. B. The necklet which the patient wears. *g*, the chain by which the necklet is connected to the apparatus producing the electricity.

tional aphonia, and in most cases of vocal weakness where there is no structural disease. In some cases one application of internal electricity is sufficient to effect a permanent cure; whilst in others the shocks are required to be repeated daily, on alternate days, or less frequently, for several weeks. I generally introduce the galvaniser into the larynx three or four times at each sitting, keeping it in each time for a few seconds. The source of electricity is not a matter of any importance, but its application to the vocal cords will be facilitated by the patient wearing a kind of elastic necklet, in the centre of which is a piece of metal covered with sponge. This plate of metal, which is enclosed in cotton, is about three inches long and one and a half broad, and is bent back in the centre, so that when applied it corresponds to the thyroid cartilage. Projecting forwards from the centre of the thyroid pad is a metal eye, by which it may be connected with the electrical machine. The pad should be wetted before

it is put on the patient's neck. When the point of the galvaniser is placed on the vocal cords the electric current passes right through them in all directions to reach the pole over the thyroid cartilage."*

SECTION I.

Morbid States not necessarily Dependent on Organic Disease.

Laryngismus Stridulus (False Croup).

Prognosis.—The danger from laryngeal spasm is greatest in very young children, and especially in those who are in feeble health. An occasional spasm generally passes off without injury, but the prospect is gloomy where the attacks repeatedly recur, and when they are attended or followed by general convulsions.

Treatment during an Attack (p. 27).

A. The spasm generally comes on so suddenly that there is but little time for treatment. The child should be placed in a warm bath as quickly as possible, and cold water sprinkled over the face and chest, so as to excite forced inspirations. An emetic of ipecacuanha will be useful if you have reason to suspect over-feeding; if an emetic is not at hand, you may excite vomiting by tickling the fauces with a feather. If the teeth are projecting and the gums inflamed the lancet should be used, and a dose of calomel may be administered when the fits show a tendency to rapid recurrence.

C. In extreme cases the inhalation of a few drops of chloroform may be tried. Where the attacks return frequently, the use of small doses of bromide of potassium or of chloral is necessary to lessen the irritability of the nervous system. Of the former two to three grains may be given every four hours to a child of one year old; of the latter the same dose, but repeated every six or eight hours.

* 'The Use of the Laryngoscope,' by Sir Morell Mackenzie.

The Prevention of Attacks (p. 36).

A. Most of the children affected with laryngismus stridulus are of a rickety constitution, and their feeding and general management should be regulated, according to the rules laid down for the treatment of that disease. All exciting causes of spasm must be removed, and every occasion of excitement or annoyance avoided. The gums ought to be carefully watched and the bowels regulated.

F. The diet is of great importance. Infants ought to have a good wet-nurse if the mother is unable to afford them sufficient nourishment, or, failing this, they should be fed on milk and lime-water, ass's milk, or concentrated Swiss milk. Beef or mutton tea may be given to older children. The effects of farinaceous food must be carefully watched, and its use forbidden if any signs of gastric or intestinal catarrh show themselves. The child should be kept as quiet as possible, and exposure to damp or cold carefully avoided.

Tonics are always required, but it is often difficult to find one that will not disorder the digestion. The hypophosphites of lime and sodium are extremely useful, and may be given in doses of one quarter of a grain to one grain to a child one year old. If the attacks return frequently the bromide of potassium should be ordered, or a small dose of chloral in case the child is very restless at night. In malarial districts quinine should be administered. As soon as the stomach is able to digest it, some mild form of iron, such as steel wine or the syrup of phosphate of iron, along with cod-liver oil, will be found beneficial.

Bilateral Paralysis of the Adductors of the Vocal Cords.

Prognosis.—When general debility or hysteria gives rise to the complaint, as generally is the case, the prospect is favorable.

Treatment.—A course of tonics, with good diet, and, if possible, change of air, is usually required. Various stimulant

remedies have been recommended to be applied to the larynx, but the employment of galvanism seems to be most successful.

The *prognosis and treatment of unilateral paralysis of the adductors of the vocal cords* are the same as when both cords are paralysed.

Bilateral Paralysis of the Abductors of the Vocal Cords.

Prognosis.—As this is chiefly the result of cerebral disease the prognosis is unfavorable.

Treatment.—When the symptoms are of a threatening nature, tracheotomy is required to save life. No local treatment is of much avail.

In unilateral paralysis the *prognosis* is generally unfavorable, and we have no means by which we can restore the parts to health.

SECTION II.

Acute Diseases of the Larynx.

Acute Catarrh of the Larynx.

Prognosis.—This disease varies greatly in intensity, and is only dangerous when it gives rise to œdema of the glottis, or when, in children, it excites croup. The ordinary cases that accompany bronchial catarrh in adults, and which may be called subacute, scarcely require treatment. When laryngitis follows erysipelas of the head and neck or smallpox, it is very dangerous, on account of its tendency to end in œdema. It is difficult to distinguish, in the first instance, an attack of laryngeal catarrh in a child from the commencement of croup. The prognosis should therefore be always of a cautious character, until you have ascertained the exact nature of the affection.

Treatment (p. 24).—**A.** The mucous membrane when affected with inflammation is more sensitive to cold air than in health. The room must be therefore maintained at a moderate heat,

which can be best managed by saturating the atmosphere with steam. A kettle, to which a long spout of tin is attached, is very convenient for this purpose. Vessels of this kind are sold under the name of "bronchitis kettles."

B. Depletion is seldom required. Some practitioners recommend the use of leeches to the sternum when the child is plethoric, the pulse firm, and the dyspnœa increasing rapidly. You seldom, however, meet with these conditions amongst a town population, although I have seen great relief given by this means in country practice. In adults the bowels should be freely purged by a saline aperient (F. 67), to which a small proportion of tartar emetic may be added; or frequent doses of chloride of ammonium may be given, with or without the addition of small quantities of tartar emetic (Fig. 119), or inhalations of the chloride of ammonium may be employed.

In children, if the loss of voice and other symptoms are trifling, it will be sufficient to prescribe frequent doses of ipecacuanha wine (F. 115), and see that the bowels are freely opened by some efficient purgative. Where the symptoms are more threatening you had better use an emetic of ipecacuanha; either the wine or the powder will answer. If the emetic does not act quickly, you may tickle the throat with a feather, and force the child to drink freely of warm water. When the ipecacuanha fails to excite vomiting, you may employ the sulphate of zinc or sulphate of copper. As soon as vomiting has been induced, put the patient into a warm bath, after which it should be removed to bed. If the symptoms are not relieved you must act upon the bowels by a dose of calomel, and keep up a slight state of nausea by small doses of ipecacuanha, or repeat the emetics from time to time. A hot poultice applied to the throat will often afford relief, or a wet compress may be used instead of it.

Stimulants are rarely required unless the heart shows signs of failing. In such cases brandy and ammonia may be given.

In adults, when the symptoms are not severe, the local application of a solution of nitrate of silver, chloride of zinc, or perchloride of iron to the larynx, by means of a brush, is generally of service, but in the more severe cases you had better trust to inhalations and general treatment.

Some practitioners recommend the use of cold externally to the

throat, by means of an ice-bag, and I have found this more useful than hot applications in children in whom the symptoms show a tendency to recur frequently. Cold may be applied to the throat or to any other part by means of a Leiter's coil. A coil of small lead pipe is laid upon the throat, the upper end of the pipe being connected by a piece of india-rubber tubing with a jug of cold water, whilst the lower end is conducted, by another piece of tube, to a basin situated below the bed of the patient. A stream of water is caused to flow through the coil by sucking the lower tube, and this keeps the skin on which the pipe rests at the requisite temperature.

D. The patient must abstain from speaking. When the symptoms are severe he should be confined to bed; in slight cases it will be enough for him to remain in his room.

G. Whenever acute œdema of the glottis presents itself, prompt treatment must be employed if you would save the life of the patient.

The epiglottis should be scarified, either by means of a gum lancet, or a curved bistoury, the blade of which is covered with plaster to a few lines from its point. If possible, the instrument should be guided by the help of the laryngoscope, but where this is not practicable the tongue must be drawn forwards, and an attempt made to reach the swollen epiglottis. An emetic of sulphate of zinc or of sulphate of copper, given before and after the scarification, often affords relief by mechanically pressing out the œdematous fluid. Some practitioners recommend the subcutaneous injection of pilocarpine when œdema is present, but the local treatment is usually more efficacious.

The neck should be fomented with a sponge wrung out of hot water, and the patient should be encouraged slowly to swallow small pieces of ice. If these means fail to remove the dyspnœa, laryngotomy ought to be performed without delay. The operation is usually successful.

A. *Amer.*—If accompanied by catarrh of the nares, this may be relieved by the patient frequently sniffing up the nose a solution of common salt (½ to 1 per cent. solution) from the hand.

B. *Amer.*—In ordinary cases, chloride of ammonium, bicarbonate or chlorate of potassium, or ipecacuanha internally, or the inhalation of

hot water or of chloride of ammonium. In severe cases, an ice-bag to the throat, or a small dose of the hydrochlorate of apomorphine as an expectorant (not as an emetic).

Fr.—In slight cases diaphoretics; a sponge wrung out of hot water frequently applied to the throat in more severe cases. When the attack is obstinate, blisters or croton oil liniment over the throat.

Germ.—In severe cases a few leeches or an ice-bag, or cold wet compresses to the throat. Inhalations of steam or of a solution of common salt (1 to 2 per cent.).

C. *Amer.*—A dose of Dover's powder or of hyoscyamus at bedtime.

Fr.—If much restlessness at night, Dover's powder.

CROUP.

Prognosis.—The prognosis of croup—that is, of acute laryngitis attended with the formation of false membrane—is very unfavorable. Although the mortality has much decreased since the more general use of tracheotomy, children under two years of age rarely recover.

Treatment (p. 24).—**A**. As it is most difficult to distinguish, in the early stage, whether an inflammation of the larynx is, or is not, attended with the formation of false membrane—whether, in fact, you have to do with true croup or only laryngeal catarrh—the treatment must in either case be the same. The child should have an emetic of ipecacuanha, followed by a brisk aperient, and be placed in a warm bath. In true croup the disease rarely yields to these remedies, and if such be the case, the patient ought to be placed in a room filled with steam, whilst nausea is kept up by repeated doses of ipecacuanha or tartar emetic.

B. Some advise venesection or leeches in the early stage, but these are rarely resorted to in the present day. Mercury is seldom employed in this country; its use is advocated by some practitioners abroad, who prescribe the perchloride in frequent small doses, or inunctions of the oleate of mercury where the former cannot be borne. You seldom require to give stimulants, unless the croup arises from diphtheria. In the later stage, when the heart is beginning to fail, you must, however, prescribe wine, ammonia, infusion of senega (F. 123), or small doses of ether.

G. Most of the cases of croup occurring in our large towns

arise from diphtheria, so that the affection of the throat, if it co-exist, must be treated as in other cases of that disease. The chief improvement of late years in the treatment of croup has

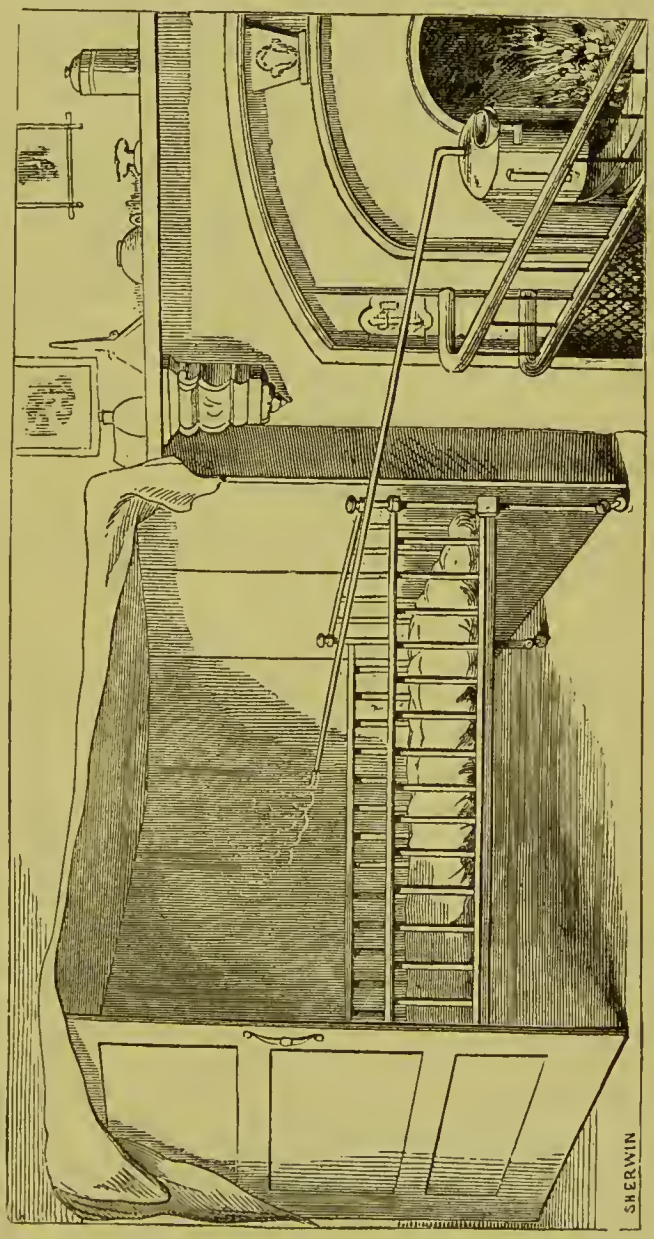


FIG. 6.

been in the more early employment of tracheotomy. This should not be delayed, as was formerly the custom, until the child seems about to die, but ought to be performed as soon as

the attacks of dyspnœa become so frequent and severe as to show that life is seriously threatened by the obstruction to the respiration.

After the operation the patient should be kept in an atmosphere of steam. This is most easily managed by placing screens around three sides of the bed, and covering the top with a thick blanket (Fig. 6). Into the vacant side let a piece of tin or india-rubber tubing be carried, connected at the other end with the spout of a large kettle placed on the fire. The temperature and moisture around the bed can be thus easily regulated. A well-trained nurse must be constantly present to clear away the false membrane from the tracheotomy tube. This can be done with a feather, or by a piece of perforated india-rubber tubing attached to a syringe. The end of the tubing is passed into the tracheotomy tube, and, when the air is sucked through it by the syringe, particles of the false membrane are entangled in the holes of the tubing, and can be easily removed.

Intubation of the larynx was once strongly recommended, but further experience has not demonstrated its superior value to tracheotomy.

Various attempts have been made to alter the secretion of the mucous membrane by dropping through the tracheotomy tube solutions of nitrate of silver, chloride of zinc, or lime water. The latter coagulates the false membrane and assists in its detachment, but we know of no liquid that is capable of putting a stop to the formation of the exudation. It is probable that the inability of the child to clear the bronchial tubes by coughing may be one reason for the capillary bronchitis and pneumonia which cause the death of so many after tracheotomy performed for croup. To obviate this, artificial respiration has been employed, and in some cases with benefit. It may be performed by alternately compressing the chest and allowing the ribs to expand. It should be continued for three to five minutes at a time, and be repeated every few hours, or whenever difficulty of breathing comes on. The case should be carefully watched until all signs of danger have passed away.

B. *Amer.*—Small and frequent doses of perchloride of mercury (for a child one year old ℥ij every hour of a solution of 1 gr. to one pint of

water). If it cannot be borne, oleate of mercury to be rubbed into the skin. When the child is robust, an ice-bag to the neck; benzoate of sodium is useless. Hydrochlorate of pilocarpine may be used where the action of the heart is good ($\frac{1}{30}$ gr. every hour for a child one year old).

Inhalation of hot water useful. Inhalations of Aqua Calcis, lactic acid, glycerine, boric acid, carbolic acid, salicylic acid, iodoform, of no value.

Fr.—In robust subjects a few leeches to the side of the neck; emetics should be frequently given (tartar emetic). In some cases apomorphine is useful.

G. *Amer.*—Tubage of the larynx to be condemned. In severe cases tracheotomy. Inhalation of oxygen has been useful in some instances.

Fr. and *Germ.*—Tracheotomy in all severe cases.

SECTION III.

Chronic Diseases of the Larynx.

Chronic Laryngitis.

Prognosis.—This is always very obstinate, and often, like chronic bronchitis, bids defiance to our most strenuous efforts to relieve it. It is especially rebellious to treatment when it occurs in old people, in those who are affected with phthisis, or who are addicted to intemperance.

Treatment (p. 32).—**A.** Where you can discover that the disease has been produced by the inhalation of dust, as occurs in some trades, means must be taken to prevent the irritation. Persons who are obliged to use their voice loudly or very frequently should be advised either to give the larynx complete rest for a time, or to moderate their vocal exertions. Habitual tipplers and excessive smokers often keep up the catarrh by maintaining a chronic inflammation of the pharynx by their pernicious habits, and the effects of a persistence in them should be plainly set before them. Exposure to damp and to night air must be forbidden. In cases of phthisis the laryngeal affection should, of course, be treated on the same principles as are employed to combat the pulmonary mischief. Syphilitic laryngitis is best

treated with iodides or mercury, and the iodine may be given internally as well as by inhalation. Chronic laryngitis is not uncommon in gouty persons, and is generally associated with a similar affection of the pharynx. It requires alkalies, small doses of colchicum, and strict attention to the diet and regimen. In all cases rest must be given to the vocal organs, and as little talking as possible should be recommended.

H. The main treatment of chronic laryngitis consists in the use of local remedies. Where you are able to attend to the case regularly, you should apply once or twice a week, or even more frequently, an astringent or stimulating lotion, with the aid of the laryngoscope. This may consist of nitrate of silver, perchloride of iron, chloride of zinc, or some other metallic preparation (F. 270). Sir Morell Mackenzie remarks that when there is diminished secretion and the mucous membrane looks red and shining, carbolic acid is the best application. It is a good plan to commence with a weak solution, and gradually to increase its strength as you find the patient can bear it. In other cases he may spray the throat daily with an astringent or stimulating lotion, such as tannic acid, nitrate of silver, or sulphurous acid (F. 272). Where the case is of a subacute character inhalations answer better than the spray, and these may be sedative, stimulating, or such as put a stop to decomposition; thus you may employ conium, hop, or benzoin, or may use creasote or carbolic acid.

In tubercular cases, where there is often excessive pain on swallowing, you may often afford relief by the application of cocaine or hydrochlorate of morphia a few minutes before each meal. Others prefer the insufflation of a powder of starch or bismuth, combined with morphia. Where these fail to afford relief, it may be necessary to use the stomach-tube, so as to introduce liquid food into the stomach. Various measures have been proposed to heal the ulcers by applications of lactic acid, lime water, and other materials, but they are rarely successful. In syphilitic laryngitis it is often necessary to have recourse to tracheotomy, as dangerous attacks of dyspnœa are very apt to occur in such cases.

Since the introduction of the laryngoscope external applications have fallen into disuse. They are, however, often ex-

tremely useful. You may prescribe small blisters over the larynx, or keep up irritation by means of iodine or croton-oil liniments.

Amer.—In ordinary cases, cubebs or compound tincture of benzoin internally; if syphilitic, mercury or iodine; if tubercular, cod-liver oil and preparations of iodine. When secretion is deficient, use as spray solution of chloride of ammonium, borax, bicarbonate of sodium, or iodide of potassium (5 gr. to 1 oz.). If secretion excessive, employ a spray of alum or tannic acid. When there is great pain, apply a solution of cocaine (2 per cent.) or of morphia. The throat should be sprayed by an alkaline wash before applying the sedative.

Fr.—Ordinary cases require small blisters or applications of iodine externally. If syphilitic, mercury or iodine, and in cases of ulcerations apply to them a solution of nitrate of silver. If tubercular, give cod-liver oil and tonics. If no ulceration, use a spray of alum or tannic acid; if ulcerations, apply solution of nitrate of silver to them.

Germ.—In ordinary cases sprays of tannin or alum. When ulcerations, apply, by a brush, nitrate of silver solution (1 to 30) every two or three days. When tubercular and attended with great pain, apply a solution of cocaine (10—20 per cent.) before food; or if this does not allow the patient to eat, morphia may be given subcutaneously, a quarter of an hour before the meal.

CHAPTER VI.

DISEASES OF THE LUNGS.

As the interchange of gases in the lungs takes place only as a result of chemical and physical laws, and is not influenced by any action of the epithelium as in other excretory organs, we are unable directly to regulate the quantity of oxygen absorbed or of carbonic acid expired. Indirectly we may effect this object by lessening the amount of carbonic acid produced in the system, or of the oxygen inhaled. Since one of the chief sources of carbonic acid is muscular contraction, we are able to diminish by rest, and increase by exercise, the quantity of the gas that has to be eliminated.

The air enters the lungs with the least muscular exertion in the erect posture; we can, therefore, by maintaining the patient in this position, assist in the due aëration of the blood. The importance of the diaphragm in respiration is often overlooked. Whenever there is great dyspnœa, and the abdomen is distended with fluid in the peritoneum or with gas in the intestines, you will find the removal of the obstruction to the descent of this muscle a matter of much importance. In old people, an ossified state of the costal cartilages renders a free action of the diaphragm more necessary than at an earlier period of life, and great relief is consequently afforded by the regular use of stimulating aperients.

Inspiration of air condensed by pressure has been employed in emphysema and chronic bronchitis with satisfactory results. Formerly the patients were enclosed in a chamber of compressed air, but of late years an apparatus contrived by Waldenburg has been substituted (see Fig. 7). "It is made of sheet zinc,

and consists of two cylinders, the larger 1 metre long and 30 cm. in diameter, in which water is put, and the height at which it stands is indicated by means of a glass tube which runs up on the outside, and is graduated in centimetres. This cylinder has

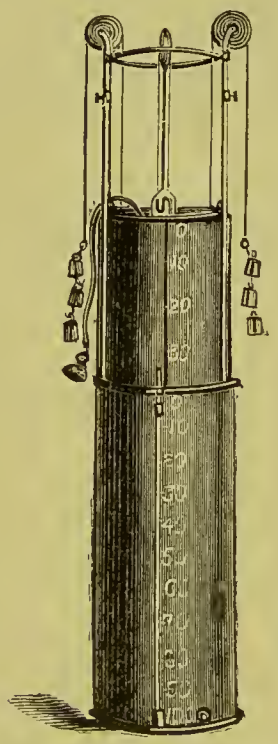


FIG. 7.—Waldenburg's apparatus for compressed air.

also a stopcock on a tube at the bottom. The smaller one is 27 cm. in diameter, and fits into the open top of the larger cylinder. Its bottom is open, and its closed top has two orifices in it, to one of which is fitted a manometer, and to the other a flexible tube, also supplied with a stopcock, and ending in the mask used in inhaling. Three rods rise from the sides of the outer cylinder, which are furnished with wooden wheels at their tops, over which play the chains which support the inner cylinder, these being fastened to the top of the latter. The free extremities of the chain which hang down outside have cross-bars or hooks, to which weights can be attached, the whole arrangement being very similar to the large receivers at the gas-works. The effect of raising the inner cylinder by

hanging weights on the chains is to rarefy the air it contains, while, when the stopcock at the top is opened and the cylinder is filled with atmospheric air—which can be readily done by simply drawing up the smaller cylinder—the result of sinking it again by placing weights on the top will be to condense the air. The weights added to increase or diminish the density of the contained air are ordinarily from 20 pounds, representing a pressure of $\frac{1}{59}$ atmosphere, to 40 pounds or $\frac{1}{29}$ atmosphere, and Waldenburg doubts if it is advisable to exceed 60 pounds or $\frac{1}{19}$ atmosphere."

"Such being the apparatus, it is advisable for several uses, depending on whether the air contained in it be condensed or rarefied, and whether the patient practise inspiration from it or expiration into it. The two principal ways in which it has been used are the following:—First, the air in the receiver being condensed, the patient draws this condensed air into his lungs in inspiration. He holds the mask firmly against his mouth and nose with the left hand, and controls the stopcock with the right. He should open the mouth and breathe deeply and steadily. The number of respirations required to exhaust, and so depress the cylinder, varies according to the capacity of the lungs of the individual, and serves as a guide to the length of time that the apparatus should be used at one sitting. Usually a sitting of from ten to twenty minutes, at which the receiver is emptied from one to three times, is sufficient. Persons whose lungs are of small capacity, *e. g.* women, or those suffering from emphysema, may require from twenty to thirty breaths to empty a receiver, which others would empty in from five to eight. Thus the capacity increases with practice, and is an index of improvement. The condensed air then pours into the lungs, and, until accustomed to it, the patient, or indeed a healthy person, has a slight sense of oppression. Soon, however, he finds that his breathing is easier than usual, and his chest becomes distended. The interchange of gases in the lungs is accelerated, and dyspnœa diminished or removed. The second method may be used by itself or combined with the one just described. It consists in breathing out into the receiver when it contains a rarefied air. Of course the effect is to empty the lungs more thoroughly than usual at the expense of

their residual air, and this being naturally followed by a deep inspiration, the effect is a thorough ventilation of the lungs. Expiration into rarefied air produces a most marked increase of the expiratory force." *

I have frequently employed Waldenburg's apparatus, and although the results have not been so satisfactory as I expected, some patients have expressed themselves better for its use. Excepting a feeling of oppression at the chest, no inconvenience has been experienced in any of my cases.

In the treatment of the diseases of the lungs and bronchial tubes we may use the remedies internally, or may apply them locally, in the form of inhalations, or when nebulised by means of some of the various spray producers already described in Chap. V.

We can increase or diminish the activity of the respiratory centre, or can control the secretions of the air-passages or facilitate their removal.

The chief means at our disposal for exciting the respiratory centre is the exhibition of ammonia, atropine, or strychnine; whilst a sedative action can be exercised upon it by the use of opium, chloroform, chloral, alcohol, or ether.

The drugs that increase expectoration are divided into the depressant and the stimulant expectorants. The former include tartar emetic, ipecacuanha, lobelia, pilocarpine, the alkalies, and iodide of potassium; of the latter, carbonate of ammonium, chloride of ammonium, senega, squill, ammoniacum, copaiba, and benzoic acid are the most useful.

Tartar emetic and ipecacuanha are employed in the acute and subacute stages of pneumonia and bronchitis, especially where the expectoration is scanty and tenacious. Both are depressors of the heart, but the ipecacuanha less so than tartar emetic. Ipecacuanha is prescribed in the cases of children and in subacute bronchitis, and, from its power of increasing the secretion of mucus, is one of the most valuable expectorants. Lobelia is used in cases of bronchitis when spasm of the tubes is also present. The alkalies and the iodide of potassium seem to increase the quantity, whilst they lessen the tenacity of the

* Ziemssen's 'Cyclopædia of the Practice of Medicine,' vol. v, p. 401.

expectoration, and thus facilitate its removal from the surface of the mucous membrane. Pilocarpine increases the amount of the secretion of the bronchial tubes, as it does that of the skin and salivary glands.

Carbonate of ammonium is invaluable, on account of its being a stimulant to the heart in the subacute and chronic bronchitis of old people, and in pneumonia when attended with depression, and is often given along with senega. The chloride of ammonium seems to increase the amount and lessen the viscidity of the expectoration, and is of most use in the early stage of catarrh of the larger tubes. It is often prescribed along with small doses of tartar emetic.

Squill is one of the most useful expectorants, and may be given in all chronic cases where there is no febrile action, whilst, from its diuretic properties, it is well fitted for bronchitis accompanied with heart disease. Some persons are very sensitive to its effects, and are apt to be sickened by very small doses.

Ammoniacum is often combined with squill, but is less generally useful than the drugs before mentioned. It seems to act most favorably when the expectoration is thin and profuse.

Copaiba, balsam of Peru, and benzoic acid may be given when the expectoration is thick and purulent. The copaiba is apt to lessen the appetite, and often induces nausea and diarrhœa. It is best given in the form of emulsion or in capsules.

The alkalies and their carbonates are often prescribed in chronic bronchitis, especially where it occurs in gouty or rheumatic subjects, and when the secretion is viscid and scanty. On account of their liability to lessen the power of the digestion, they ought not to be continued for any length of time, but should either be omitted occasionally, or be given in combination with some vegetable tonic.

Sedatives are employed to diminish the violence or frequency of cough. Opium is the most useful of these, and enters, in some shape or other, into almost every formula prescribed for this purpose. The more spasmodic the cough, and the more it arises from irritation, the more beneficial will this drug be found. It must, however, be employed with great caution in the diseases of children and of old people when there are signs of failure of the heart, and especially when the expectoration is copious and

the breathing difficult, lest the bronchial tubes become overloaded through the diminution of the cough. Where opium is contra-indicated, hydrocyanic acid, conium, hyoscyamus, belladonna, or some other sedative may be employed.

SECTION I.

Morbid States not necessarily Dependent on Organic Disease.

An imperfect decarbonisation of the blood attends various diseases of the lungs and heart. In order that the respiratory functions should be properly performed, it is necessary that the air should have free access to and from the pulmonary vesicles, and that the venous blood should be brought into contact with it in sufficient quantity. If there be a narrowing in the larynx or trachea, as occurs in croup, or if the smaller bronchi be obstructed, as in asthma, or the pulmonary vesicles be blocked up, as in pneumonia and phthisis, there must be an imperfect aëration of the blood. The same effect is produced when the muscles which expand the chest are unable to execute their office, as in certain forms of poisoning and in some diseases of the brain and spinal cord. Where, on the other hand, a free circulation through the lungs is prevented, as in dilated heart or emphysema, the interchange of the gases contained in the blood with those of the external air is necessarily lessened.

Cyanosis.

If the arterial blood is imperfectly aërated it retains more or less of the venous colour, and consequently those parts of the body which ordinarily present a rosy hue, as the lips, ears, nose, and ends of the fingers, become dark or blue; this condition is known by the name of cyanosis. When imperfect aëration of the blood proceeds to such an extent as to cause death, the patient is said to have perished from asphyxia. On post-mortem

examination the venous system and the right side of the heart are found overloaded with blood, whilst the left ventricle and auricle contain only a small quantity. In like manner the pulmonary artery and its branches are over-filled, the pulmonary veins being comparatively empty.

The effects of the circulation of imperfectly oxygenated blood are soon felt throughout the whole system, and the symptoms are urgent in proportion to the rapidity with which it has occurred. A sense of oppression at the chest is experienced, which produces efforts at forced inspiration; the heart beats languidly, and as the left ventricle receives a diminished supply of blood the pulse becomes feeble, small, and rapid. The mental functions are imperfectly performed, the patient is drowsy, incapable of thought, the sensations are blunted, and a low form of delirium occurs. The muscular efforts are feeble, the temperature falls, the secretions of the various glands become smaller in quantity and deteriorated in quality. The extremities grow cold, the face is covered with perspiration, and, unless relief is afforded, the patient sinks into a state of coma, with or without convulsions. Where venous congestion is long continued and cyanosis is slowly produced, dropsy usually makes its appearance.

The above remarks have reference only to the imperfect aëration of the blood that occurs in the progress of disease. They do not apply to the blueness of the skin occasionally seen in children, which is known as cyanosis, but which arises from a congenital malformation of the heart or pulmonary artery.

The prognosis of cyanosis is always grave, especially when it has been rapidly developed. You meet, however, with cases of emphysema in which it has been gradually produced, and in which there are no serious symptoms. But in these an attack of bronchitis which would be productive of but little injury to a healthy person, may quickly produce fatal congestion of the lungs.

Treatment.—This depends, of course, entirely on the cause producing it. When the upper part of the air-passages is obstructed an attempt must be made to give relief by means of tracheotomy, or some other means best calculated to effect this object. If the smaller bronchial tubes are occluded with mucus

which the patient is unable to expel, a stimulating emetic, such as one of mustard or sulphate of zinc, will be of service. Where the right side of the heart has become rapidly overloaded with blood, either by reason of a constricted mitral valve or acute pulmonary inflammation or congestion, venesection is indicated. The quantity of blood to be drawn need not exceed eight or ten ounces, and the operation may, if desirable, be repeated. But if the cyanosis has come on from a gradual failure of the heart, bleeding will add to the mischief, and you must direct your efforts to stimulate the muscular walls to greater exertion by means of alcohol, ammonia (F. 72), ether, and digitalis (F. 78).

In all cases place the patient in an upright position, and let him have a free supply of cool air. You may also, by hot bottles applied to the feet, and mustard poultices or dry cupping to the chest, determine an increased amount of the blood to the surface of the body, and thus help in relieving the pulmonary circulation.

Dyspnœa.

This may arise from any cause which prevents the due oxygenation of the blood. Consequently it presents itself as a symptom of most of the diseases of the lungs and heart, and its progress and treatment depend upon the condition from which it arises. But it should be remembered that alterations in the blood are likewise capable of producing difficulty of breathing; thus it is often a prominent symptom in chronic Bright's disease, and relief, under such circumstances, can only be obtained by directing the treatment so as to relieve the affection of the kidneys.

Anæmia, and especially "*idiopathic anæmia*," likewise gives rise to it, the number of red blood-corpuscles being insufficient to absorb the necessary amount of oxygen. Here iron and other measures required to overcome this condition are indicated. There is one form of dyspnœa that is often misunderstood. It is a tendency to sighing, produced by an inability to draw a full breath, not an actual difficulty of breathing. It is caused by distension of the transverse colon preventing the descent of the diaphragm. It is best treated by stimulating aperients, tonics, and a careful regulation of the diet.

Cough.

This is present in most of the diseases of the lungs and air-passages. It may be attended with expectoration, or it may be dry. In the former case there is some inflammation of the air-tubes, but when dry it may be the result of irritation of the throat, pharynx, larynx, or some other part of the organs engaged in respiration. For example, it often comes on during the operation of tapping a pleura distended with fluid, or it may be the earliest sign of pneumonia. You must not look upon cough as a certain indication of lung disease, for irritation in a distant organ may produce it; worms in the intestines, uterine derangements, or dyspepsia often give rise to it. Disease of the brain in children is not unfrequently preceded by it, and a most distressing form of cough often occurs as a result of hysteria without any accompanying organic disease.

Whenever you have evidence of the existence of disease of the lungs or air-passages, you must attempt to relieve the cough by attention to the malady that produces it. You ought to be careful not to prescribe, as is commonly done, sedatives in the early stages of phthisis or other disorders, in which it is all-important to maintain the nutrition of the patient, for these remedies are apt to lessen the appetite and impair the digestive power. Whenever there is very profuse expectoration you must not be too solicitous to lessen the cough, for by so doing you run the risk of allowing the mucus to accumulate in the smaller bronchial tubes to a dangerous extent.

Most cases of chronic bronchitis are accompanied by catarrh of the throat, pharynx, or upper part of the larynx; make it a rule, therefore, always to examine these parts before commencing your treatment. I have repeatedly seen persons supposed to be suffering from early phthisis or bronchitis, whose cough depended upon an enlarged uvula, the cough disappearing as soon as a portion of it was removed. It is on account of the frequency with which the throat is inflamed, along with the bronchial tubes, that sedative mixtures and lozenges are so useful in bronchitis.

Whenever you meet with cough coming on in paroxysms

always carefully examine the throat. If this is normal and there are no signs of whooping-cough, you should search for a source of irritation in other organs. If evidence of worms be discovered you must attempt to remove them ; if there be signs of dyspepsia or hepatic congestion direct your attention to the stomach or liver. In cases of hysterical cough bromide of potassium (F. 107) along with a sedative inhalation are the most effectual remedies. Persons liable to gout often suffer from cough of this character, and under such circumstances the treatment should be such as will tend to relieve the gouty condition. Spasmodic cough is, however, not unfrequently one of the earliest symptoms of aneurism of the aorta, so that in every case the state of the heart and aorta should be most carefully examined before you venture upon a prognosis or commence your treatment of the case.

Pains of the Chest.

Pain referred to the chest is a common subject of complaint, and may arise from very different causes. When situated upon or over the clavicles it may be produced by rheumatism or periostitis, or it may accompany the early stage of phthisis. On the other hand, neuralgic pains in this part are often due to irritation of the gums set up by decayed teeth.

Pain in the front of the chest is commonly supposed to be a precursor of phthisis, and this is more especially the case when there is also cough and a slight expectoration. Most of these cases are, however, dependent on dyspepsia; the stomach or transverse colon being distended with flatus pushes up the diaphragm, and thus causes a painful feeling of constriction. A sense of tightness referred to the front of the chest is a common symptom of acute bronchitis ; whilst in other instances the uneasiness arises from muscular rheumatism. Whenever pain in this region obstinately resists treatment carefully examine the ribs and cartilages, for syphilitic periostitis is not uncommon.

Pain at the sides of the chest may originate from rheumatism, dyspepsia, or pleurisy, but it may also be a symptom of disease of the spinal bones or cartilages. In the latter case the pain is

usually felt on both sides, although the neuralgia may be more intense on one than the other. You must never neglect to remove the clothing when pain of recent origin is complained of, for a scalding sensation is a common prelude to an attack of herpes zoster, and the discovery of a few spots will clear up the diagnosis at once.

Pain between the shoulders may be due to various morbid conditions. The most common are dyspepsia from atony of the colon, and irritation produced by gall-stones. It may arise from diseased spine, aortic aneurism, or muscular rheumatism. A cause frequently overlooked is neuralgia connected with spinal irritation. Tenderness on pressure of one of the dorsal spinous processes will generally show you if such is the case.

Asthma.

Prognosis.—This may occur as an independent affection, or may be an accompaniment of other diseases, such as emphysema, bronchitis, dilated heart, or chronic Bright's disease. In children it is often associated with eczema of the skin, more especially where there is an hereditary tendency to gout or scrofula. In such cases the asthma frequently subsides at the age of puberty. Where it occurs in adults for the first time the prognosis is much less hopeful. The attacks may, however, sometimes be restrained by proper treatment, and they often disappear when the exciting cause can be avoided. In long-standing cases emphysema is usually present, either as the cause or result of the asthma. Always examine for nasal polypi, as in many instances the slight surgical operation involved by their removal has been followed by a complete cure of severe asthmatic attacks.

Treatment during an Attack (p. 29).

A. The exciting cause has usually been removed before the attack has come on. But you may discover that the bowels are overloaded, and you then commence your treatment with an aperient; in children a dose of castor oil is suitable, in adults

calomel and colocynth (F. 161), or a purgative enema answers best. Occasionally an attack comes on shortly after a meal of some indigestible material, and you may afford relief by the exhibition of an emetic. Twenty grains of powdered ipecacuanha is sufficient for this purpose, but some practitioners prefer the subcutaneous injection of $\frac{1}{20}$ to $\frac{1}{10}$ of a grain of apomorphine, as effecting this object with less depression.

You must allay the irritation of the bronchial tubes by having the patient placed in a large and well-ventilated room, which, in the winter, should be properly warmed. When it is associated with bronchitis, and the expectoration is viscid and difficult, the air of the room should be saturated with steam ; but where the dyspnœa is excessive and the weather warm, you more frequently relieve by having the doors and windows kept open.

C. Sedatives and antispasmodics are the chief means at our disposal. In the slighter cases a mixture of morphine, ether, and camphor mixture, with or without lobelia, will suffice (F. 175) ; or relief may be given by four or five grains of the citrate of caffein. Some persons keep the caffein always at hand, as they find that by its means they are often able to ward off a threatened attack. If more severe, the tincture of belladonna may be used with bromide of potassium (F. 187), or any of the above may be combined, and in heart cases you should add digitalis. Many prefer the subcutaneous injection of morphine in severe attacks, one sixth or one fourth of a grain often giving immediate relief. It may be given along with $\frac{1}{120}$ or $\frac{1}{80}$ gr. of atropine ; it is most useful where there is but little co-existing bronchitis, and should not be employed when there is much secretion in the tubes. It is always wise to try a small dose of morphine on the first occasion, such as one eighth or one sixth of a grain, and to repeat it in an hour or two if it is unsuccessful. In cases attended with dryness of the mucous membrane, great relief is afforded by repeated doses of the acid tartrate of potassium combined with squills, or by the liquor ammonii acetatis, given in hot water. Where there is no bronchitis, repeated doses of chloral sometimes succeed, and some have recommended the use of nitro-glycerine. When the asthma is associated with emphysema or bronchitis, and the expectoration is difficult, the subcutaneous use of atropine alone

($\frac{1}{100}$ or $\frac{1}{80}$ gr.) is often successful, and may be followed by an ether and lobelia mixture. Antipyrine (gr. xx) often acts beneficially in obstinate cases, and is usually worthy of trial.

In almost every case you can afford relief by inhalations. When the patient is unaccustomed to tobacco, a cigar is often sufficient, or the stramonium or datura tatula may be employed. The French "antiasthmatic cigarettes" are still more valuable. Blotting-paper, soaked in a strong solution of nitre and afterwards dried, when set on fire upon a plate placed near to the patient, seldom fails to lessen the dyspnœa. "Himrod's remedy" sometimes answers when all others fail, or a powder much used at the Brompton Hospital may be tried (F. 317). A teaspoonful of this powder should be placed on a plate, and, when lighted, the fumes should be inhaled through a large inverted funnel.

In the employment of all these vapours, remember that much of their value depends on the way they are used. The patient should try to inhale the smoke, and when this cannot be done, you may enclose him, along with the vapour, in a closet or a small room.

In severe attacks, chloroform is often employed as an inhalation, and affords rapid relief; but the dyspnœa usually returns as soon as the effect of the drug subsides. It is unnecessary to produce insensibility, as a small dose generally suffices, but its frequent use lessens the appetite, reduces the strength, and increases the irritability of the patient. He should never be allowed to use it for himself, for serious consequences have often resulted from a person falling asleep over a handkerchief wetted with the drug, or in close proximity to an unstoppered bottle containing it. The nitrite of amyl has been recommended, but seems to have no advantage over chloroform. Some have advised the application of a solution of ammonia to the pharynx, but this is a very doubtful proceeding, as the dyspnœa in many persons is increased by it.

In all cases observe what remedy seems to afford most relief, so that it may be employed on a recurrence of the attack.

D. Where the dyspnœa is not excessive, let the patient remain in bed in a sitting position, well propped up with pillows, so as to allow as free a motion of the chest as possible.

In severe cases, all the supplementary muscles of respiration are called into play, and you will find it most advantageous to let him sit in front of a low table, with the elbows supported by books or cushions. Many spend whole nights in this posture, until the severity of the attack has passed away. The patient usually refuses food, and it is not advisable to press upon him more than is necessary, because any undue distension of the abdominal organs prevents the easy descent of the diaphragm. A cup of hot and strong coffee is commonly useful, and in slight cases often affords immediate relief. In other instances, small quantities of gin or whisky are more efficacious.

Treatment for the prevention of asthma (p. 37).

A. The first and most essential point is to ascertain if the residence of the patient is unsuitable. Some are free from the attacks in the midst of a crowded city, others only in the open country; one patient is best at a considerable elevation above the sea, another on low ground; most suffer at the sea-side. You may often get an idea as to the locality most likely to be suitable, by finding from the patient whether his attacks are more general in cold or warm, or in damp or dry weather, and whether they are ushered in or followed by the symptoms of bronchitis. When the asthma is associated with bronchitis, the autumn and spring are the worst periods of the year; when it arises from the general health, it is not unusual to find the attacks occur more frequently in the middle of the summer.

In every case you must ascertain if there is any tendency to rheumatism, gout, or scrofula. In rheumatic persons you will get the best results from a long-continued course of liquor potassæ, bromide and iodide of potassium, with or without vegetable tonics; the state of the skin being, at the same time, carefully attended to by the use of warm or vapour baths. If gout is hereditary, or if your patient has been a sufferer from it, he will derive most advantage from a course of colchicum, along with magnesia or ammonia, and cinchona (F. 13), the urinary functions being, at the same time, carefully regulated. When a scrofulous tendency exists, prescribe cod-liver oil,

iodide of iron, cinchona, or other tonics of a similar nature, along with a nutritious diet.

F. In every case you will find it of advantage to attend to the digestive organs. Indeed, you will be successful in your treatment in proportion as you can secure the co-operation of the patient in your endeavours to effect this object. As a general rule, you must insist upon as little food being taken as will suffice to maintain health, and a neglect of this precaution will often provoke a severe attack. Most of the seizures occur at night, and it is a useful plan to make the patient dine in the middle of the day, and, unless there be some serious objections to it, let him take animal food only at that time. Stimulants should be avoided.

The action of the bowels must be attended to, and this is so important that few cases progress favorably when it is neglected. It is better to avoid salines, and to trust to aloes combined with nux vomica (F. 155), or belladonna, or to a laxative electuary (F. 132). The urine should be watched, and, if a superabundance of lithic acid be detected, appropriate treatment ought to be used.

H. When the digestive and eliminative organs have been regulated, it is advisable for you to attempt to improve the nutrition of the nervous centres. If anæmia is a prominent symptom you may use iron ; if this is not present you may with greater advantage prescribe zinc (F. 233). A long course of arsenic (F. 2) is indicated when you find an eczematous eruption has existed, or has alternated with the asthma. Where there is undue excitability of the nervous system, strychnine (F. 228), with or without iron or quinine, will be found more beneficial.

Treatment during an attack.

A. *Amer.*—If necessary, act on the bowels or give an emetic of ipecacuanha.

C. *Amer.*—Dry cups between shoulders, or mustard poultices to the chest, are often of use. In severe attacks, subcutaneous injection of morphine ($\frac{1}{6}$ to $\frac{1}{4}$ gr.), with atropine ($\frac{1}{100}$ to $\frac{1}{80}$ gr.). Chloral is next in value (30 grs.). Inhalation of chloroform, of paper soaked in nitre, of stramonium or datura tatula.

Fr.—Sinapisms to the chest. Swallowing of fragments of ice often relieves. Inhalation of nitre paper, stramonium, or belladonna.

Germ.—Morphine or chloral. Mustard to the chest. Inhalation of chloroform, nitrite of amyl, iodide of ethyl (15 to 30 minims), of nitre paper, or of stramonium.

Treatment for the prevention of asthma.

Amer.—Iodide of potassium or arsenic is of value. Euphorbia pilulifera (an ounce of fresh, or half an ounce of the dried plant, to be boiled in two quarts of water down to one quart; dose, three or four wineglassfuls may be used daily).

Fr.—If the asthma is of rheumatic or gouty origin, give alkalies; if associated with eczema, arsenic or preparations of sulphur; if it follows chronic bronchitis, this must be treated by iodide of potassium (15 to 45 grs. daily) with tincture of lobelia. In catarrhal asthma use inspirations of compressed air.

Germ.—Remove any cause. Examine carefully for nasal polypi, &c. Iodide of potassium, bromide of potassium, or belladonna may be given. Whenever the attacks seem to be regularly recurrent, prescribe quinine.

Treatment for the prevention of hay asthma.

A. The patient should avoid the localities in which he has been previously attacked, especially at the season of the year when the atmosphere is likely to be loaded with the pollen of the plants that produce the complaint. The sea-side is most suitable for his residence, and in bad cases a sea voyage may be required. When it is impossible to leave his home a respirator, moistened with carbolic acid, may be worn out of doors. Respirators have been contrived for the nostrils, and are said to have proved useful in the prevention of the attacks.

H. Tonics are almost always of value in diminishing the irritability of the mucous membranes. Strychnine (F. 228), quinine (F. 215), and the valerianate of zinc (F. 233) answer best, or they may be combined with iron if the patient is anæmic (F. 199). I have known the application of a solution of cocaine (5 to 10 per cent.) to the nostrils afford relief; the inflammation of the conjunctiva may be treated with a solution of sulphate of zinc or boracic acid. In some instances the mucous membrane over the inferior and middle turbinate bones

has been found to be hypertrophied, and the removal of the diseased structure by the galvano-cautery is said to have lessened the liability to the attacks of the complaint.

SECTION II.

Acute Diseases of the Lungs.

Pleurisy.

Prognosis.—Pleurisy presents itself under two very different forms: in one it is accompanied by the exudation of lymph only; in the other liquid effusion is also present, which distends the cavity and compresses the lungs. Dry pleurisy is usually the result of some irritation of the lung or neighbouring parts. It may attack the patient only once, or may recur from time to time; it is attended with little or no danger to life, and its duration is usually short. Where liquid effusion occurs there is commonly considerable fever, which may last from ten to twenty days, but the degree of danger depends more on the malady which has given rise to it than on the pleurisy itself. When it is the result of cold there is rarely much risk to life, although the symptoms may be very threatening, excepting the patient is old or has undermined his health by indulgence in alcohol, or where the effusion is very extensive. Even when acute pleurisy accompanies phthisis, which is not uncommon, it is not necessarily dangerous to life. Where, however, it presents itself in kidney affections or in pyæmia, the risk is much greater, and a large proportion succumb. In fact, whenever pleurisy is secondary, the prognosis is grave.

Empyema is often recovered from in the case of children, the pus being absorbed, or making its way through one of the intercostal spaces. But in adults it is much more apt to end fatally, since the chest wall is unable to contract sufficiently to

come into contact with the compressed lung, after the pus has been evacuated. Chronic pleurisy, whether associated with thickening or with fluid exudation, is dangerous, because it so often arises from phthisis or cancer, and on account of the difficulty with which the walls of the chest become accommodated to the compressed lung.

Treatment (p. 24).—**A**. Where the pleurisy occurs in acute rheumatism, pyæmia, or kidney disease, the primary disorder must be borne in mind, and the treatment modified accordingly. In other cases you have no power to act on the cause of the inflammation.

B. Venesection, which was formerly always employed, is now rarely used, but I have seen it in country practice, when the patient was young and the pulse hard, afford rapid and permanent relief. In young persons, where the pain is severe, you will find benefit from the application of leeches; in an adult you may apply six to twelve, and repeat them if necessary. You may also use hot poultices with advantage; they should be reapplied frequently, and be sufficiently large to cover the whole of the affected side. Some have recommended ice externally, but warmth gives more relief. It is usual to promote the action of the skin by means of salines, and some practitioners add tartar emetic (F. 65) or aconite (F. 68) whenever the pulse is firm. If the pulse is feeble and compressible, stimulants must be given, and this is especially the case in secondary pleurisy and in empyema, or in the case of drunkards.

C. If the amount of pain is moderate, and is felt, as is not unusual, chiefly at night, you may prescribe a dose of the pulv. ipecac. co., with or without a few grains of calomel, and trust to local applications. When it is continuous and severe, opium must be your main reliance. It relieves pain, and thereby gives partial rest to the walls of the chest, lessening the difficulty of the breathing. You may use it either internally (in doses of one grain three or four times a day) or subcutaneously (one sixth to one quarter of a grain of morphine). In inflammation of the pleura accompanying chronic disease of the kidneys, or where the heart is feeble, opium must be given with great caution. Where the patient is young and plethoric, you may often observe that it affords only partial relief until

leeches have been applied, after which the pain will rapidly subside.

D. In all cases the patient must be confined to his bed, the air of the room being maintained at a moderate warmth (65° to 68°). All unnecessary movements of the body and talking must be prohibited. In the early stage he usually prefers to lie on the opposite side, or on the back, so as to limit the motion of the ribs; but when the effusion is great he rests on the affected side, whereby the pressure upon the healthy lung is lessened.

Dr. Roberts applies long straps of sticking-plaster round the chest in pleurisy, to afford rest to the inflamed part, and states that it is most useful in the pleuritic attacks so common in phthisis. I have found this plan of advantage in local pleurisy, and in chronic cases where the pain remains after all other symptoms have disappeared; but when the inflammation is general, or tenderness of the side is a prominent symptom, strapping usually increases the suffering. You will get the best idea as to its probable usefulness by trying if the pain is relieved or increased by the firm pressure of the hand over the affected side. It is an objection to the employment of the strapping, that it prevents the use of the hot poultices and fomentations which are so valuable in relieving pain. Some prefer the application of a wide bandage of india-rubber to the chest instead of the plaster.

E. The diet should consist of beef-tea, milk, and farinaceous food. If there is much depression, strong soups, jellies, and alcohol are required.

G. When the fluid shows no sign of disappearing after the inflammation has subsided, the question arises as to the best method of removing it. Where the amount is not large you may employ diuretics, such as the acetate or citrate of potassium (F. 90), with or without digitalis, or you may prescribe the iodide of potassium (F. 11). When the patient is anæmic or the illness has lasted for some time, absorption is often quickly excited by the exhibition of tonics, and especially of the tincture of the perchloride of iron; or where there is reason to suspect a tendency to tuberculosis, the iodide of iron and cod-liver oil may be prescribed.

The frequent application of blisters to the affected side assists the absorption of the effusion, but they should not be prescribed until the fever has subsided. You will find it more useful to employ small blisters often repeated, than to keep up a constant discharge by means of stimulating ointments. When you have reason to suspect thickening of the pleura, or where the exudation has existed for some length of time, a liniment of iodine should be painted over the part, or a weak mercurial ointment may be rubbed on the side.

Instead of trusting to diuretics and blisters you should tap the chest under the following conditions:—1. If the effusion has lasted more than a month, without showing signs of absorption. 2. If the difficulty of breathing is intense, or seems to be increasing quickly. 3. If you have reason to suspect that the fluid in the pleura is purulent. 4. In all cases of double pleurisy with effusion. 5. In any case in which you find a tendency to faintness, or the patient suffers from attacks of dyspnœa, or has severe cough with viscid expectoration, or presents fine crepitant râles over the unaffected side, you must not delay the operation, however insignificant his other symptoms, or the physical signs of the malady, may seem.

On the contrary, it is wise to omit or delay the operation—1. In cases in which there is a clear resonance on percussion down to the third rib, no marked enlargement of the side, and no severe dyspnœa. 2. So long as the fever persists, and there are no urgent symptoms arising from the pressure of the fluid. 3. Where the effusion has occurred on the side in which there were previously indications of tubercular disease.

As regards the method of tapping the chest, Dr. Bowditch recommends the site of the puncture should be thus selected:—"Find the inferior limit of the sound lung behind, and tap two inches higher than this on the pleuritic side, at a point in a line let fall perpendicularly from the angle of the scapula. Push in the intercostal space here with the point of the finger, and plunge the trocar quickly in at the depressed part; be sure to puncture rapidly and to a sufficient depth, or you may be baulked by the false membranes occluding the canula." Dr. Douglas Powell advises the puncture to be made in the sixth intercostal space, in the mid-axillary line; whilst Professor

Marshall prefers the fifth space, in the line of the nipple. In each case you should satisfy yourself, by careful percussion and auscultation, that the lung is not adherent at the point you select. It is a good plan to pass the needle of a hypodermic syringe into the spot at which you intend to operate, as, in this way, you can not only satisfy yourself that the fluid can be readily reached, but you can also ascertain whether it is serous or purulent.

In removing the fluid the aspirator is usually employed, but some prefer a piece of india-rubber tube attached to the end of the canula, and carried downwards into a basin partially filled with an antiseptic solution, and placed at a lower level than the chest of the patient. It is not necessary to remove all the fluid from the chest at once, for the withdrawal of eight or ten ounces will usually afford immediate relief; indeed, I have often seen the evacuation of a very small quantity so alter the exudation, that absorption has proceeded rapidly after the operation.

Although it is rare for any ill effects to follow the use of the aspirator, this sometimes takes place. Spasmodic cough occurs in some cases, and if the breathing becomes much affected, it will be advisable for you to stop the flow of the liquid, and defer the emptying of the cavity till another time. The subcutaneous injection of morphia will generally stop the cough. In chronic cases great pain is sometimes experienced from the stretching of the adhesions, and under such circumstances you must stop the operation, and be content to draw off the fluid in small quantities at a time, so as to permit of the more gradual expansion of the lung.

There are no certain symptoms by which you can ascertain whether the fluid is serous or purulent, but, as a general rule when pus is present, the fever is higher, rigors occur, emaciation makes rapid progress, and profuse night-sweats enfeeble the patient. Under such circumstances you should introduce a hypodermic needle and ascertain if the exudation is purulent. If the pus be not decomposed and there are no urgent symptoms you may aspirate, and in the case of children this sometimes proves successful; but if the pus is in a state of decomposition, or the symptoms are urgent, you should introduce a drainage-tube at once.

Since in empyema you are anxious to empty the pleura completely of the pus, the opening should be made lower than in aspiration. It is generally recommended to make it in the seventh or eighth intercostal space, in the posterior axillary line, but others prefer the fifth interspace in the nipple line, when the operation is performed on the right side. Some surgeons resect an inch or two of one of the ribs to gain more room. The drainage-tube is introduced and fastened to the side of the chest, or two openings may be made and the tube passed from one to the other. When the fluid is in a state of decomposition, it is necessary to wash out the pleura daily, but it is safer to do this by means of an irrigator than a syringe. Various kinds of antiseptic lotions containing carbolic acid or iodine are used for this purpose.

In empyema, as in all other cases attended with suppuration, you must aim at supporting the strength of the patient. Thus you give quinine (F. 215) or iron, or both combined (F. 199). If there be any contra-indication to these, you may prescribe acids and bitter infusions, such as calumba or cinchona (F. 220). A liberal diet must be allowed, and if the patient be unable to take solid food, you may prescribe strong soups, jellies, beef-tea, &c. A moderate amount of wine is also necessary, or, if the patient be young, you may use malt liquors with advantage.

B. *Amer.*—Bloodletting rarely necessary. In some cases a large dose of quinine is useful in the first stage. Poultices afford more relief than an ice-bag.

Fr.—If symptoms are urgent at first, venesection or leeches. Tartar emetic or digitalis in the early stages.

Germ.—Mustard or hot poultices to the affected part.

C. *Amer.*—If pain is severe, opium internally, or the use of morphia subcutaneously.

Fr.—Where leeches cannot be borne, prescribe morphia.

Germ.—If pain is severe, morphia internally or subcutaneously.

G. *Amer.*—Jaborandi is sometimes useful, but generally diuretics are to be preferred. In more chronic cases the perchloride of iron assists absorption.

Fr.—Blisters, diuretics, and digitalis.

Germ.—As diuretics, acetate of potassium, the borotartrate of potassium and sodium, or squills.

All advise tapping of the chest where there is much dyspnœa or other urgent symptoms.

Pneumothorax.

Prognosis.—As this accident most frequently takes place in phthisical subjects from the rupture of a cavity, the prognosis is unfavorable. It is especially so during the first day or two, but if the shock be surmounted improvement may take place, and the patient's life may be preserved for many months. A few recover, or, at any rate, all urgent symptoms disappear. The most favorable cases are those where the accident occurs from an empyema discharging itself through the lung, or from the bursting of a dilated air-cell in emphysema.

Treatment.—**B.** When the dyspnœa was extreme and the patient plethoric, venesection was formerly recommended, to reduce the quantity of blood that had to be transmitted through the uncompressed lung. Since the introduction of the aspirator venesection has been rarely employed. It is now generally advised, when the symptoms are severe, to evacuate the air by tapping the chest, although, of course, in most cases the operation will have to be repeated from time to time. The trocar should be introduced between the fourth and fifth ribs, outside the nipple line. Do not remove the trocar, if cough comes on, until this ceases; the irritation producing the cough is best relieved by the subcutaneous injection of morphine. After the tapping, the affected side should be kept at rest by the application of broad straps of sticking-plaster. If the symptoms are not very distressing and the patient's health is not failing, it is wise not to tap the chest, as the compression of a tubercular lung often seems to arrest the progress of the pulmonary disease.

In most cases it is requisite to act pretty briskly on the bowels, so as to lessen the amount of the circulating fluid unless diarrhœa is present. If there is much depression, as is usual when the accident takes place in those who have long suffered from phthisis, you should keep up the action of the heart by brandy, ammonia, or ether, and carefully avoid any circumstance likely to reduce the patient's strength.

C. Where the symptoms are only of moderate intensity, you

may order a mustard poultice, or turpentine fomentations to the chest, so as to increase the circulation through the skin. Some practitioners prefer dry cupping or the application of a large blister. If the pain is severe, you may prescribe opium by the mouth, with or without antispasmodics, such as ether (F. 174), lobelia (F. 175), or chloroform; or you may inject subcutaneously one quarter of a grain of morphine, but it will be necessary to repeat the sedative every two or three hours until relief is obtained.

D. If you see the patient shortly after the accident, when the dyspnœa is severe and the pain excessive, you must give as much rest to the lungs as possible. In most cases he prefers to sit upright; others lie with their head inclined forwards; but in any case it is best to let him maintain the posture in which he feels most comfortable.

G. Where the pneumothorax has arisen from empyema, or a large quantity of pus has collected in the pleura, a drainage-tube should be introduced without delay.

B. *Amer.*—Alcohol may be required to sustain the strength of the patient. Hot-water bags afford relief to pain.

Fr.—Venesection is occasionally requisite. Ice-bags relieve pain, and tend to condense the air in the pleural cavity.

C. *Amer.*—Hypodermics of morphia usually required.

Fr.—Opiates most important part of the treatment.

Germ.—Morphia alone capable of giving relief.

G. *Amer.*—If dyspnœa excessive, paracentesis with a *small* aspirator. Operation may be repeated. Strap the chest afterwards.

Fr.—Paracentesis of the chest.

Germ.—If only air in the chest, and dyspnœa excessive, aspirate; if fluid is also present, aspirate. If pus is present, use incision with drainage.

Acute Bronchitis.

Prognosis.—When the larger tubes are alone affected, there is no danger to persons who are otherwise in good health. The symptoms generally lessen in severity as soon as the expectoration becomes loose, and the complaint ordinarily subsides in two or three weeks. When the patient has previously suffered from chronic bronchitis, an acute or subacute form of the com-

plaint often occurs as a prelude to its recurrence. Where a young person has frequent attacks of acute bronchitis, always examine the chest carefully, lest there should be tubercular disease in the lungs.

The prognosis of acute capillary bronchitis is always grave. In adults it is often associated with emphysema, phthisis, heart disease, contracting kidneys, or some other serious chronic disorder, and under such circumstances it often proves fatal. In children it may follow catarrh of the larger tubes, and often produces death, by causing collapse of portions of the lungs. Whenever a child is affected with bronchitis, you ought to visit it frequently, and watch the progress of the malady closely, as the signs of collapse of the lung not unfrequently occur suddenly.

Treatment (p. 24).—**A.** In adults, examine for signs of phthisis, emphysema, heart disease, or chronic disease of the kidneys; and if any of these be present, modify your treatment accordingly. For example, in dilatation of the heart, you will most likely require to prescribe digitalis; in diseased kidneys, active purgatives; if the skin is dry and inactive, hot or vapour baths assisted by diaphoretics. When you have reason to suspect that the bronchitis is of a rheumatic character, you will find the salicylate of sodium in frequent doses of great value, whilst colchicum combined with alkalies affords the quickest relief in those liable to attacks of gout (F. 13). In all cases aperients are useful in the early stages of the complaint, as a free evacuation of the bowels allows the more easy descent of the diaphragm, and thus tends to lessen the congestion of the pulmonary circulation. In children, examine the teeth and the alvine evacuations: if the teeth are projecting, lance the gums; if the stools seem to be disordered or the bowels confined, prescribe a dose of calomel, since a brisk aperient often greatly relieves, by removing any undigested material that may, by its presence in the intestinal canal, keep up irritation of the nervous system. If the symptoms are at all threatening or severe maintain the room at an even temperature (65° to 68°), and encourage secretion from the mucous membrane by filling it with steam.

B. Your remedies will require to be varied according to the

age of the patient and the part of the bronchial membrane inflamed. In adults, where the larger tubes are alone affected and the expectoration is scanty and tenacious, you may prescribe small doses of tartar emetic (F. 88), or ipecacuanha (F. 87), in combination with diaphoretics, until expectoration takes place freely. When the symptoms are not severe, the chloride of ammonium (F. 119), with or without tartar emetic, is very valuable. In the case of children, you should employ tartar emetic only in small doses, as it is apt to irritate; generally ipecacuanha is more useful (F. 115).

When the larger tubes are alone inflamed, you should change the treatment as soon as the secretion becomes loose and copious. Small doses of the compound tincture of camphor and tincture of squill, along with senega or cascarilla (F. 121), form the most appropriate treatment.

If the strength of the patient seems to have been reduced by his illness you must have recourse to tonics, such as iron, quinine, or strychnine (F. 199). The mineral acids, in combination with vegetable bitters (F. 211), are especially useful when the expectoration continues to be copious, as they seem to act as tonics to the relaxed mucous membrane of the bronchial tubes, at the same time that they promote the digestion and increase the strength of the patient.

Where much soreness is complained of you should order a linseed or mustard poultice, or, in the case of adults, an opiate liniment may be rubbed on the chest. Be careful not to use opiate liniments to children, but trust to poultices or stimulating embrocations. It is often of advantage, where you wish to keep up the circulation of the skin over the chest, to cover it with a thick layer of cotton wool, since the long continuance of hot poultices is apt to produce discomfort by their weight and moisture. In children, it is better to have the chest rubbed two or three times a day with a stimulating liniment, and afterwards covered with cotton wool, than to apply poultices.

In capillary bronchitis occurring in adults, where there has been great dyspnœa attended with cyanosis, I have prescribed venesection; but such a measure is rarely required excepting where the malady has attacked a person suffering from constriction of the mitral valve. Indeed, you rarely employ even

tartar emetic, on account of the tendency to depression. You may, however, use dry cupping to the chest with advantage. Mostly you require stimulants, such as carbonate of ammonium, ether, and infusion of senega (F. 122), along with small and frequently repeated doses of alcohol. Many practitioners have advocated the employment of leeches, followed by poultices, in children affected with capillary bronchitis. The objection to this is that the loss of blood enfeebles the child, and so predisposes to pulmonary collapse. You will find ipecacuanha, with an occasional emetic, more efficacious whenever the secretion is excessive or difficult to expel.

In severe cases the inhalation of oxygen gives considerable relief, though its use is seldom attended by permanent benefit.

C. In bronchitis of the larger tubes in adults, a sedative draught of chloral (F. 108), or compound ipecacuanha powder, may be given at bedtime to procure rest; or if the expectoration is scanty and tenacious, and the cough very troublesome, you may use codeia, hyoscyamus, hop, or bromide of potassium, in repeated doses, during the day. When the expectoration is loose, or the cough seems to arise from irritation of the larynx, a linctus of the compound tincture of camphor, or of morphine with Aqua Laurocerasi, will afford relief (F. 183). Where there is capillary bronchitis, opiates should be used with great caution; they ought not to be employed where the secretion is excessive, or where there is much dyspnœa.

D. When the case is a slight one it is sufficient that the patient should remain in his room, but if the symptoms be severe he must be confined to bed.

E. As in all other inflammations, the diet should consist of liquids, the material being adapted to the general condition of the patient.

A. *Amer.*—In rheumatic cases use salicylate of soda.

Fr.—In slight cases it is only necessary to avoid exposure to cold.

Germ.—In mild cases, warmth and rest are alone necessary.

B. *Amer.*—In severe cases occurring in robust people, venesection; in children, leeches and hot poultices. In both, give diaphoretics and tartar emetic or veratrum; and if the tongue is coated, a dose of calomel. In feeble persons, senega and ammonia. In the capillary bronchitis of children, leeches are to be used.

Fr.—In severe cases, when there is little secretion, do not give emetics, but use mustard or other irritants to the chest. In capillary bronchitis leeches and emetics should be employed; but in old and feeble persons quinine and alcohol. In the later stages ammonia and senega.

Germ.—When the cough is hard, use inhalation of steam, or of a solution of common salt (one to two per cent.). In severe cases dry cupping, but never local or general bleeding. If the expectoration is hard, chloride of ammonium, ipecacuanha, or apomorphia in small doses. In children use a tepid bath three times a day, or the wet pack. In old people the Liq. Ammon. Anisi (F. 314) and senega.

C. *Fr.*—When the cough is troublesome give Dover's powder.

Acute Lobar Pneumonia.

Prognosis.—This varies greatly in different cases, since the disease occurs along with two opposite conditions of the system. The sthenic, which is the more common form, is associated with a tolerably firm but small pulse, high temperature, troublesome cough, and glutinous or bloody expectoration; whilst asthenic pneumonia is more frequently developed during the course of some other illness, and is accompanied by a feeble, compressible pulse, lower temperature, less troublesome cough, deficient expectoration, dry tongue, and sordes on the lips and teeth. Sthenic pneumonia generally ends favorably, by a sudden crisis, on the seventh or ninth day, the temperature often falling many degrees within twelve hours, and all the symptoms being at the same time mitigated. Asthenic pneumonia, on the contrary, usually shows no distinct crisis, and the prognosis is, as a rule, unfavorable. Both forms are apt to end badly in drunkards, and in persons suffering from disease of the kidneys or other important organs. The chances of death increase also in proportion to the age of the individual. Very rapid breathing and a comparatively low temperature are unfavorable signs. Delirium in adults and convulsions in children indicate danger. When both lungs are inflamed, which is almost always associated with some constitutional disease, the danger to life is great. Pneumonia attacking phthisical persons is not necessarily more dangerous than under other circumstances, but it is not unfrequently ushered in with profuse hæmoptysis.

Treatment (p. 24).—As the disease may occur under such

entirely different conditions, the treatment must vary in a corresponding degree.

B. In the sthenic form, general and local bleeding used to be always recommended—indeed, it was one of the diseases in which such a method of treatment was looked upon as sure to be beneficial. Of late years we have been, perhaps, too much in the habit of neglecting bloodletting, probably because the danger to life in an uncomplicated case is small, and the relief at the crisis is so complete. In country practice, however, and in strong plethoric persons, venesection is often very beneficial, by preventing or removing dangerous congestion of the unaffected lung. Niemeyer lays down the following judicious rules for its employment:

"1st. When the pneumonia has attacked a vigorous and hitherto healthy subject, is of recent occurrence, the temperature being higher than 105°, and the frequence of the pulse being more than 120 beats a minute. Here danger threatens from the violence of the fever, and free venesection will reduce the temperature and lessen the frequence of the pulse. In those who are already debilitated and anæmic, bleeding increases the danger of exhaustion. Should the fever be moderate, bloodletting is not indicated, even in healthy and vigorous individuals.

"2nd. When collateral œdema in the portions of the lung unaffected by pneumonia is causing danger to life, the pressure of the blood is reduced by bleeding; and by prevention of further transudation of serum into the vesicles, insufficiency of the lung and carbonic acid poisoning are averted. Wherever the great frequence of respiration in the commencement of a pneumonia cannot be traced to fever, pain, or to the extent of the pneumonic process alone, as soon as a serous foamy expectoration appears, together with a respiration of forty or fifty breaths a minute, and when the rattle in the chest does not cease for a while after the patient has coughed, we ought at once to practise a copious venesection in order to reduce the mass of blood, and to modify the collateral pressure.

"The third indication for bleeding arises upon the appearance of symptoms of pressure upon the brain, not headache and delirium, but a state of stupor or transient paralysis."

In cases where the heat of the skin is not excessive, and the

pulse is tolerably firm and regular, a diaphoretic mixture is all that is required ; but if the expectoration is very hard and difficult, frequent doses of tartar emetic, along with some saline (F. 124), will be found useful. Do not attempt to allay the cough by opium, as this drug tends to lessen the amount of the expectoration. When the pulse is unusually rapid you may use digitalis in moderate doses. Some prefer aconite (F. 68) or veratrum for this purpose, but the action of the latter should be carefully watched, as it sometimes produces great depression.

When the heat of the skin is excessive it is of importance to reduce it, as a high temperature tends to exhaust the muscular structure of the heart, and so predisposes to the failure of its power. This is best effected by means of the "ice cradle" (Fig. 19), or in the case of children the patient may be wrapped in a sheet wrung out of cold water, and afterwards covered with a dry blanket. The bath must be repeated as often as the state of the temperature seems to require it. When the temperature is below 103° and the respiration not much embarrassed, there is no occasion to have recourse to the cooling process, but it should be employed whenever there is a continuous temperature above 103°, and especially where, along with this, delirium or sleeplessness is present.

Where there is severe pain you will find no necessity for venesection ; the application of leeches to the side often affords immediate relief. Hot poultices may in all cases be used, and be frequently repeated. In Germany, cloths wrung out of cold water have been generally prescribed, but in this country the application of heat is preferred. According to our experience the application of an ice-bag over the seat of pain affords more relief than hot poultices or fomentations, whenever the temperature of the body is high.

Even in the sthenic form you may require alcoholic stimulants, especially at the crisis, when the heart, deprived of the excitement afforded by the high temperature, is apt to fail. They are necessary, even in the early stage, if the patients are old or feeble, where the pulse becomes rapid, feeble, or irregular, or where, along with a weak pulse, there is delirium or continued sleeplessness.

In the asthenic form, which may be present from the first,

or may show itself a few days after the commencement of the illness, you must carefully avoid all depressing treatment. On the contrary, you prescribe carbonate of ammonium with infusion of senega (F. 122), quinine (F. 216), or decoction of cinchona (F. 219). In some instances you may give quinine in larger doses with benefit (four to five grains for a dose). To relieve pain, the chest should be covered with a hot linseed poultice, or, in the case of old people or children, with cotton wool covered by a piece of oil-silk. In the pneumonia of drunkards, half-drachm doses of the tincture of the perchloride of iron forms the best treatment. You should maintain the strength of the patient with beef-tea, soups, and alcoholic stimulants.

In either form, as soon as the more active symptoms have subsided, you must support the strength of the patient by acids, quinine, or other tonics (F. 218), along with a nutritious diet. Where there is a return of the crepitation in the affected lung after the cessation of the inflammation, the tincture of perchloride of iron, in half-drachm doses, usually proves beneficial, and should be given along with some form of alcoholic stimulant.

C. You seldom have occasion to use sedatives, excepting in certain asthenic cases, where the patient's strength seems to fail from want of sleep, or where, with a moderate temperature, there is delirium or persistent sleeplessness. Under such circumstances you should prescribe a dose of Dover's powder or of morphine at bedtime ; but it is advisable not to give chloral, lest the power of the heart should be enfeebled by it. When convulsions occur in children, along with an elevated temperature, the use of the cold pack is especially efficacious.

D. It is almost unnecessary to say that the patient should be kept in bed and prevented from talking. He may be allowed to choose his own position.

E. The diet should consist of liquid food, and he may be allowed to drink as freely as his thirst prompts him to do.

Where you have reason to believe that gangrene of the lung has taken place, you must attempt to keep up the patient's strength with ammonia and cinchona (F. 219), quinine (F. 216), or some other tonic. Inhalations of carbolic acid, creasote, or turpentine are of great service in correcting the fœtor, and a liberal quantity of wine must be allowed. Some recommend

turpentine internally (F. 62) as a stimulant in this class of cases. Where general and local treatment seem likely to prove unavailing, an attempt may be made to drain the cavity by an opening through the walls of the chest.

Catarrhal Pneumonia.

Prognosis.—Besides the ordinary lobar pneumonia, we often encounter another kind of acute inflammation of the lungs. This, which is comparatively rare in middle life, is common in young children. It generally results from an extension of the inflammation of the capillary bronchial tubes to the air-vesicles, or it attacks portions of a lung that have become collapsed. It is most commonly met with after measles or whooping-cough, more rarely it is a consequence of diphtheria, smallpox, scarlatina, or typhoid fever. It is apt to follow bronchitis when this has affected children suffering from rickets, tuberculosis, or other constitutional diseases. The prognosis is much more grave than that of lobar pneumonia, 50 per cent. of those attacked succumbing to the disease. It is most fatal to children under one year of age, and the danger decreases in proportion as the patient approaches puberty. The duration of the acute stage is usually from ten to fourteen days; there is no marked crisis, as in lobar pneumonia; convalescence, in cases of recovery, is always tedious, and relapses are common.

Treatment (p. 24).—**A.** In some cases of children the bronchitis, which occasions the pneumonia, is the result of an irritation of the digestive organs, set up by the presence of undigested materials. It is therefore wise in every instance to see that the bowels are acting in a natural manner, and if not, to give a dose of calomel, or some other aperient, before other treatment is commenced.

B. The older writers recommended leeches, but there is the same objection to any depressing treatment as in capillary bronchitis, of which the pneumonia is usually but an extension, viz. the fear of diminishing the power of inspiration and thus inducing collapse of the pulmonary tissue. In adults, in most cases, you must give carbonate of ammonium, with or without senega (F. 122) or bark, and repeat the dose frequently. The

liquid extract of bark answers best with children, and may be combined with the aromatic spirit of ammonium. In most cases alcohol is required; in young children you should begin with a small quantity, say five or ten drops of brandy every three hours in milk, and increase the amount if the effect seems to be beneficial. During convalescence, steel wine along with cod-liver oil is useful in assisting the patient to regain his health. In all cases you stimulate the skin of the chest by hot poultices, with or without mustard sprinkled over them; or in children or old persons you may cover the chest with a thick layer of cotton wool. When the powers of inspiration seem to flag, you should employ frictions with stimulating liniments to the chest, such as the ammonia, or the acetic acid and turpentine liniment. As the skin of young children is very tender, these should be mixed with oil.

C. Never prescribe opium. Instead of trying to soothe the cough, you should regard it as useful for clearing away the mucus that obstructs the tubes. The chance of recovery, in fact, depends on maintaining the power of the respiratory muscles. Where the cough is very distressing, you may prescribe hyoscyamus or bromide of potassium, in combination with ipecacuanha or squill.

D. The patient should remain in a room warmed to 62° or 65°; and in the early stage, if the expectoration is scanty, the air may be warmed and made moist by the use of the bronchitis kettle.

G. The removal of the mucus from the bronchial tubes is a matter of primary importance, and if you observe them becoming choked, and the breathing rapid and shallow, you must give emetics. Ipecacuanha is usually employed in doses of one eighth to one quarter of a grain for a child one year old, repeated, if necessary, two or three times a day. Of late, apomorphine has been strongly recommended in Germany, inasmuch as it excites vomiting without nausea and without much depression of the heart. It is best to use it hypodermically. Apomorphine should, in our opinion, be employed with great caution and in moderate doses, as we have known it produce very serious depression. Others prescribe senega as a stimulating expectorant, along with ammonia and ipecacuanha.

SECTION III.

Chronic Diseases of the Lungs.

Hydrothorax.

Prognosis.—This depends upon the nature and gravity of the disease of the heart or kidneys from which hydrothorax usually arises. The fluid is present in both sides of the chest, unless one pleura is obliterated by adhesions. Although only part of a general dropsy, it adds greatly to the danger of the patient by compressing the lungs, and thus increasing the difficulty of the pulmonary circulation. It is always a bad omen, and should be viewed as an unfavorable sign whenever it makes its appearance.

Treatment (p. 32).—**A.** The treatment must be secondary to that of the complaint which has produced it, but it generally requires to be energetic.

G. The question not unfrequently arises, whether you can by local measures assist in the removal of the fluid from the pleuræ. Blisters are in most cases employed, excepting when the kidneys are acutely inflamed, when it is better to trust to the application of iodine or croton oil than risk an increase of the nephritis from the absorption of the cantharides. Where the dyspnœa is severe you must employ the aspirator to give relief, and the removal of only a few ounces will often afford great comfort to the patient. Remember that in chronic disease of the kidneys any operation may set up dangerous inflammation of the part on which it is performed, and that in other cases the fluid quickly collects again.

Chronic Bronchitis.

Prognosis.—This is, when uncomplicated, rarely fatal, although, from its being so often an accompaniment or conse-

quence of disease of the heart, lungs, or kidneys, it is often the immediate cause of death. It is apt to occur annually in persons of middle or advanced age, at first appearing only during the cold and damp weather of the autumn and spring, but afterwards being constantly present. The symptoms are, however, always aggravated by atmospheric changes. When habitual it is seldom cured, but persists, to a greater or less degree, during the whole life of the patient.

Plastic bronchitis is very obstinate, often lasting for many years, and at last subsiding of itself without any apparent reason. It usually occurs in early or middle life; rarely, if ever, in old age. Although the symptoms are often very severe, death is a rare termination.

Dilated bronchial tubes are most common in childhood, and persons affected with them may live for many years. The symptoms are very similar to those of chronic phthisis, with which, indeed, the complaint is often confounded. The patient may either die of exhaustion, or he may be cut off by an attack of acute bronchitis.

Treatment (p. 30).—There are few diseases so common, and whose treatment is so unsatisfactory, as chronic bronchitis. The failure in treatment arises from the frequency with which it is an accompaniment of other and more serious morbid changes, from its being apt to occur in those whose vital powers are enfeebled by age, and also because we are often unable to remove the circumstances that tend to maintain it.

A. The most important point is to obviate anything producing or keeping up the morbid action. Amongst the poor, a dusty occupation will often render all treatment useless, since air loaded with irritating particles is constantly being passed through the inflamed tubes. Millers, ropemakers, stonemasons, and persons engaged in like occupations, are especially liable to the disease. They may be tolerably well during the summer, but as soon as the mucous membrane becomes irritated by the cold and damp atmosphere, the dust in the rooms in which they work sets up inflammation. A damp climate is in other cases the exciting cause, and the patient can only overcome the complaint by changing his residence. Rheumatism, gout, and syphilis are very common causes of chronic bronchitis. Whenever

you have reason to suspect these conditions, you must direct your treatment accordingly.

In every case examine the throat. The uvula, tonsils, and larynx are generally in a state of chronic catarrh, and local applications to these parts will often at once alleviate the symptoms.

F. Watch carefully the nutrition of the patient. If his appetite flags, you may prescribe quinine (F. 215), cascarilla, or some other bitter (F. 211); if anæmia is present, use iron (F. 199). Cod-liver oil is as valuable as in phthisis, and is especially of use where the expectoration is profuse. Always examine the urine before commencing your treatment, as chronic atrophy of the kidneys often first shows itself by an attack of bronchitis. Where there is no albumen, see that the excretion of urine is sufficient in quantity and not loaded with lithic acid.

G. Where you can find no indication for treatment, either in removing the causes of the complaint or in the defective nutrition of the patient, you must content yourself with relieving the symptoms, and more especially the cough. You will find the character of the expectoration your best guide.

1. When the *expectoration is scanty and difficult of expulsion*, alkalies (F. 19, 22) are most useful, and with them you may combine ipecacuanha or squill as an expectorant. If there is a tendency to rheumatism, you may also add iodide of potassium. When the cough is severe, use bromide of potassium, hyoscyamus, or conium; but do not give opium, as this tends to lessen secretion. Carbonate of ammonium is most useful in old persons, and where the heart is feeble. When the larynx and trachea are at the same time affected, the inhalation of conium is of great value. Along with this tough and scanty mucus there is frequently also a tendency to asthma, and then you may combine with the alkalies bromide of potassium, belladonna, ether, or chloroform. Poultices and stimulating frictions should be used externally.

2. If the *expectoration is free and muco-purulent*, opium, in all its various preparations, is invaluable (F. 121). The stimulating gums, such as benzoin, copaiba, and cubebs, are also of use. Externally, blisters and croton-oil liniments may be applied, especially when the smaller tubes are affected.

3. Where the *expectoration is very profuse and watery*, nothing is equal to the ammoniacum mixture, with or without squill.

4. The more nearly *the expectoration approaches in appearance to pus*, the more useful are tonics. You may use iron, quinine, strychnine, and especially cod-liver oil. Where the expectoration is excessive and loose, and there is no great dyspnœa, astringents may be cautiously tried, but they should be abandoned if the dyspnœa increases. The best of these are gallic acid (F. 45), acetate of lead (F. 60), the tincture of larch, and small doses of turpentine (F. 62).

5. In *plastic bronchitis*, the iodide and bromide of potassium, along with cod-liver oil, are of service. We are advised by some foreign practitioners to employ lime water, lactic acid, and the alkaline carbonates in the form of spray, but we cannot speak of them from our own experience. A sea voyage has, in some cases, succeeded when all medicines have failed.

6. The treatment of *fetid bronchitis* is the same as that required for gangrene of the lung (p. 116). Respirators, wet with some antiseptic fluid (F. 273, 274), should be worn constantly.

A. *Amer.*—In all severe cases let the patient, if possible, winter in a warm climate.

Fr.—In scrofulous cases use preparations of iodine and sulphur; in gouty cases alkalies; when connected with heart disease, digitalis, diuretics, or purgatives.

Germ.—The patient should reside in a warm climate in winter.

G. *Amer.*—The most useful remedies for chronic bronchitis are iodide of potassium, the Grindelia robusta, Eucalyptus globulus, Œnothera biennis, Cimicifuga racemosa, Asclepias tuberosa, balsams of copaiba and tolu, benzoin, turpentine, cod-liver oil, and the hypophosphites of sodium, calcium, and iron. When the cough is harsh and dry, the muriate of ammonium, or the iodide of potassium, with small doses of antimony and a sedative, answers best; if the expectoration is abundant, the balsamic and terebinthinate remedies. When there is abundant secretion, inhalations of carbolic acid and camphorated tincture of opium are the most useful. Where there is deficient secretion, add to the mixture one drachm of the oil of Scotch pine.

Fr.—If the expectoration is dry, use alkalies and squill; when there is little expectoration, with the stethoscopic signs of secretion in the tubes, prescribe strychnine or nux vomica. When secretion is abundant let the

patient inhale creasote ; but if there is a tendency for it to become fetid, inhalation of the benzoate of sodium or of carbolic acid.

Germ.—Where the secretion is dry and hard, expectorants, like ipecacuanha or apomorphia, are of use ; when profuse, turpentine or balsam of Peru may be used ; acetate of lead may be also employed. Where there is little secretion, use an inhalation of a 2 per cent. solution of common salt or bicarbonate of sodium ; if the secretion is profuse turpentine (F. 301) is to be preferred.

Emphysema of the Lungs.

Prognosis.—This is essentially a chronic disorder, often lasting for many years, and although it causes great distress, it rarely of itself proves fatal. It produces a tendency to asthma, chronic bronchitis, acute capillary bronchitis, and dilatation of the heart, and in this way is a common cause of death. When emphysema has existed for some time it is seldom cured, but you may give great relief by reducing the co-existing inflammation of the bronchial tubes.

Treatment.—So long as the patient is free from bronchitis there is not much necessity for medical treatment. The digestive process is ordinarily deranged, on account of the pulmonary and hepatic circulations being obstructed, chronic gastric catarrh being thereby produced. An occasional dose of blue pill will, under such circumstances, afford great relief, and should be followed by a course of alkalies or mineral acids combined with some of the vegetable bitters (F. 213). It is scarcely necessary to say that the diet must be carefully regulated, that the food should be taken in moderate quantities, and should consist of substances that are readily digested. The patient must endeavour to ward off attacks of bronchitis by avoiding exposure to night air, cold, and damp.

When he is attacked by asthma, acute capillary bronchitis, chronic bronchitis, or dilated heart, the treatment must be conducted on the principles recommended for these diseases. Thus, if dropsy should supervene, you must prescribe digitalis or convallaria, or if the liver be also congested, blue pill or calomel along with diuretics (F. 99) ; when attacks of asthma form the prominent symptom, iodide of potassium is especially useful, and the same drug may be employed, along with alkalies, when

the expectoration is tough and scanty. When, however, the expectoration is loose and copious, the hypophosphite of sodium or the phosphate of iron, with cod-liver oil, is more likely to be of service. The dyspnœa, when it is not dependent on bronchitis or dilated heart, is often relieved by inhalations of compressed air or by exhalations into rarefied air.

You may lessen the chance of complications by improving the nutrition of the patient by moderate exercise, a carefully regulated diet, and by the exhibition of iron, strychnine, arsenic, or quinine, with or without cod-liver oil. You must also bear in mind that a part of the pulmonary circulation is destroyed, and that therefore the organs which, like the kidneys and skin, eliminate water, may require to be maintained in active operation by the occasional use of diuretics and sudorifics.

PHTHISIS.

Prognosis.—This varies very greatly, some patients dying in three or four months, others living for many years.

Age exercises a marked influence on the duration of the disease, those above fifty being much more liable to chronic phthisis than younger individuals. Where the complaint follows bronchitis of long standing the progress is usually slow, whilst many of the most rapid cases occur in persons who have previously enjoyed excellent health. When an hereditary predisposition is strongly marked, there is generally a greater tendency to rapid phthisis than in others. The higher the temperature and the longer it is sustained, and the more quickly the loss of flesh proceeds, the more certainly may you look for a rapid termination of the case. The early supervention of night sweats or of intractable diarrhœa is a bad sign, whilst a constipated state of the bowels is a favorable indication. Early hæmoptysis, if it is not accompanied nor followed by a high temperature, is not necessarily a bad symptom; on the contrary, many cases of this description make slow progress. Œdema of the legs, aphthæ of the mouth, or severe and continuous diarrhœa, tends to show the case is approaching to its close.

Treatment.—**A**. You should, in all cases, teach the patient to

avoid whatever is likely to quicken the progress of the disease. For example, he should never expose himself to damp, cold, night air, or any other circumstance apt to provoke bronchitis. His general health must be strictly watched, and everything tending to diminish his vital powers should be guarded against. Where he is able to do it, nothing is so valuable as spending the winter months in a warm and dry atmosphere, so long as the disease is in a chronic state or at an early stage. But if there is much fever, or the disease is far advanced, great injury is often done by travelling, and by the loss of the home comforts necessitated by a foreign residence. Where the patient has suffered from syphilis, iodide of potassium is invaluable. In most cases attacks of a febrile character are apt to occur, the temperature being elevated during the day as well as at night. Under such circumstances, the patient should be confined to his room or to his bed, according to the amount of fever; the diet must consist of liquids, and febrifuge medicines may be given. It is not a good plan to restrict him to a milk diet, although milk or koumiss may be freely given, but animal broths should be also allowed.

F. The main principle in every case of chronic phthisis is to improve the general health, so as to favour the tubercular formation becoming walled in by fibrous tissue.

The diet is of the first importance, and every effort should be used to induce the patient to take articles of a fatty nature. Cod-liver oil is the best of these, and may be given along with orange or ginger wine, or with acids (F. 211). Sulphuric acid (F. 218) is most suitable when there is any tendency to diarrhœa, night sweats, or hæmoptysis, but in other cases the phosphoric acid is more agreeable to the patient (F. 228). Where the oil cannot be borne during the day, it is often digested when taken at bedtime; in other cases an emulsion of it with liquor potassæ answers well.

It is a good plan to begin with a small dose, such as a teaspoonful, and gradually to increase it as it seems to answer. It agrees best during the cold months of the year, and when the patient is able to take exercise out of doors; but it is digested with difficulty during the summer months, when the patient is liable to dyspepsia or diarrhœa, or when there is much fever.

Combinations of the oil with extract of malt and with pepsine have been employed, and these sometimes agree when the oil alone cannot be borne; in other cases, ten or fifteen drops of ether given along with it enable the patient to digest it.

The extract of malt is a good substitute for the oil; and rum and milk, taken early in the morning, seem also to promote the production of fat. Gelatinous materials, such as oysters and Iceland moss, are valuable, and may be used at any stage of the disease. Starchy food can be often assimilated where there is an objection to fat, and corn-flour, rice, sago, and arrowroot may be freely given. As a general rule, alcoholic stimulants agree and are very useful, especially in the later stages, all excess being of course forbidden. A liberal supply of animal food should be afforded, both to improve the nutrition, and also to compensate for the loss of albumen caused by the expectoration.

In all cases you should watch and regulate the digestive organs. Do not, however, imagine that the mere prescribing of tonics is enough, for you will constantly find them disagree, on account of the presence of chronic gastric catarrh. This must be first removed, and afterwards they may be given with advantage. Every now and then you will have to omit them for a time, and direct your attention to the disordered state of the stomach.

The mineral acids are the most useful tonics, and may be combined with light bitters, such as gentian or calumba (F. 209). If the appetite is very bad and the strength much reduced, you may give quinine or bark. When there is much anæmia, iron or zinc is required, but iron is unsuitable where there is a tendency to frequent attacks of hæmoptysis. Arsenic is one of the most valuable tonics in chronic phthisis, and may be given in doses of three to five minims after food, but it should not be continued for any length of time. It is most useful when there is a tendency to asthma. Strychnine (in doses of $\frac{1}{32}$ to $\frac{1}{24}$ gr.) is looked upon by some practitioners as almost a specific in the retching so common in cases of phthisis, and is also valuable as a tonic. During the attacks of a febrile character, antipyrine or the salicylate of sodium may be given, but quinine is usually to be preferred, either in three or five grain doses, or in combination with digitalis and small doses of opium. It has been proposed to

treat phthisis by the injection of sulphuretted hydrogen gas up the rectum, but the cases so treated in this country have not proved successful.

Of late years some success has been obtained by the internal administration of creasote and guaiacol. The former may be given with tincture of gentian, commencing with a dose of one or two minims, the amount being gradually increased until as much as 15 to 30 minims are taken daily.

Guaiacol is usually preferred to creasote, and may be prescribed in the form of a pill (gr. 3—15).

Take care in all cases of chronic phthisis to regulate the bowels at the same time you give tonics, for, unless this is attended to, few will agree (F. 155).

H. You should avoid everything likely to reduce the strength of the patient. Unless, therefore, it is absolutely requisite, never order leeches. In the second stage, the frequent repetition of small blisters below the clavicles is of great value in relieving the cough and promoting expectoration; but when the cough is hard and spasmodic, a liniment of croton oil usually proves more useful than blisters. Where there is much thickening of the pleura, the application of iodine should be preferred. Issues and setons used to be employed, but they are not of sufficient value to compensate for the weakness and discomfort they produce.

Cough is the symptom to which you are always expected to pay especial attention. Do not use opiates more freely than you can help, as they tend to lessen the appetite, and thereby impair the nutrition of the patient. It is a good plan to give some mild sedative, such as chloral (F. 109) or the compound ipecacuanha powder (F. 185), at night, so that the patient may have sufficient sleep, and to trust to small blisters and other forms of counter-irritation to allay the cough in the daytime. In the later stages, morphine, codeia, and other sedatives are necessary to afford the patient relief from his sufferings (F. 183).

Inhalations are extremely valuable in the treatment of phthisis, and may be used either as disinfectants, or as sedatives to the cough. Respirators are convenient for this purpose, and may be worn with advantage many hours at a time. The inhalations usually employed consist of a mixture of iodine, carbolic acid,

creasote, or eucalyptus, with or without the addition of chloroform (F. 274).

The chief complications are hæmoptysis, bronchitis, pleurisy, diarrhœa, night sweats, and aphthæ.

Amer.—It is necessary to secure the assimilation of as much food as possible, and to improve the health of the patient by every measure in our power. Alcohol in some form is usually of value, and also cod-liver oil. When there is a difficulty in the digestion of the oil, 15 minims of ether may be given half an hour after each dose. Arsenic, the hypophosphites of sodium or lime, and other tonics, are generally useful.

If there is a high temperature, give quinine. In the early stage relieve cough by hyoscyamus, codeia, or hop, but at a later period morphia should be used. Night sweats may be controlled by belladonna, atropine, oxide of zinc, gallic acid, or acetate of lead. Dr. Pepper has in several cases injected cavities with a weak solution of iodine or carbolic acid.

Fr.—In febrile cases prescribe quinine. For night sweats, use acetate of lead, belladonna, or atropine, and, in some cases, strychnine. For cough, give morphia, codeia, or chloral. In many cases, blistering or the application of iodine to the chest is useful.

Germ.—Inhalations of carbolic acid, benzoate of sodium, and iodoform have proved useless to stay the progress of the disease. In incipient cases arsenic is sometimes of value. Creasote may be given along with cod-liver oil. If the expectoration is difficult, use inhalations of conium, common salt, or bicarbonate of sodium; if the secretion is copious, inhalations of tannin, turpentine, or balsam of Peru.

Hæmoptysis.

Prognosis.—Spitting of blood may arise from hæmorrhage occurring in various parts of the mucous membrane of the mouth or throat. You must, therefore, first ascertain if it has originated in the gums, pharynx, or posterior nares. It may, again, be the result of an aneurism, or the blood may have come from the stomach. The question as to aneurism you will have to settle by physical examination, after the hæmorrhage has been subdued.

In hæmoptysis, the danger is in proportion to the amount of blood lost, the persistence of the bleeding, and the previous state of the patient's health. A fatal termination in a first attack is

rare; this is more apt to occur where there has been long-standing fibroid phthisis. In such instances the bleeding often takes place from a small aneurism of the pulmonary artery projecting into the lumen of a cavity.

Treatment (p. 24).—**B**. When the hæmorrhage arises from heart disease, it is better not to attempt to restrain it, as it tends to relieve the congestion of the lung which has produced it. Under such circumstances, you may with advantage prescribe digitalis or convallaria, along with sulphate of magnesium and infusion of roses (F. 49), or if there is any congestion of the liver, five grains of calomel may be given for two or three nights in succession. In the early stage of phthisis a similar method of treatment may be employed, as a moderate hæmorrhage often seems to be beneficial. If the bleeding persists, a blister to the chest is often of use.

In severe cases, and more especially if a cavity is present in the lungs, an injection of morphine (gr. $\frac{1}{4}$) is exceedingly useful, as it allays the nervous agitation of the patient, and by quieting the heart's action predisposes to the formation of a thrombus at the seat of hæmorrhage. You may also prescribe gallic acid, with or without ergot (F. 46), alum, acetate of lead (F. 60), or ergot with small doses of opium. Of these, the gallic acid is best suited for recent cases, whilst alum is more efficacious when the bleeding has persisted for some time. You may inject subcutaneously one or two grains of ergotine, but the disadvantage of using it in this way is that sometimes inflammation is set up around the puncture, which may be followed by suppuration. This is not so apt to occur if gelatine discs are employed. The injection should always be given into the muscular tissue of the buttock or back. Ice is an excellent astringent. Small pieces may be allowed to melt in the mouth, or may be swallowed from time to time, and when the hæmorrhage is violent an ice-bag placed upon the chest is often efficacious. All food must be taken cold.

When the bleeding has been so severe that the patient seems likely to sink from exhaustion, ten to thirty minims of turpentine (F. 63) may be given every two hours, or it may be alternated with doses of ergot. In obstinate cases, ligatures or bandages may be applied to the limbs, sufficiently firm to obstruct

the veins whilst they leave the arterial circulation unaffected. The inhalation of a spray, composed of twenty to thirty minims of solution of perchloride of iron to half an ounce of water, has been found useful in allaying hæmorrhage. In one severe case Dr. Cayley produced collapse of the lung by puncture of the pleura, and in another Dr. Williams injected twenty grains of tannic acid into the pulmonary structure. In each the hæmorrhage was arrested, but both patients died within a few days after the operation.

There is a form of hæmoptysis in which, in spite of astringents, the bleeding persists for weeks, although not to any great extent; under such circumstances the tincture of perchloride of iron (F. 56), or the pernitrate of iron, is of use. When the case has been very obstinate, an emetic of sulphate of zinc has sometimes effectually put a stop to it. Do not use alcohol unnecessarily in hæmoptysis, for you must bear in mind that fainting is a natural method of arresting hæmorrhage. In bad cases, however, you may administer brandy by the mouth, by the rectum, or subcutaneously.

When the tendency to recurrence of the bleeding is strongly marked, you must teach your patient to avoid all severe exercise. Forbid him to run, or climb hills, or, in fact, to use any excessive exertion. Let him eat and drink sparingly, let all his food be taken rather cold, and let him avoid alcoholic liquors. Do not prescribe cod-liver oil, as this often seems to produce a return of the bleeding. If mineral tonics are necessary, you will find preparations of zinc preferable to those of iron.

D. Perfect rest is, of course, a most essential matter during the attack. Place the patient in a sitting position, so that he may more readily clear the bronchial tubes of the accumulated blood. Forbid him to talk, and let him breathe with as little extra exertion as possible. The air of the room should be cool, and, if necessary, the doors and windows may be kept open. Maintain a cheerful face, for hæmoptysis is an alarming accident, and you are sure to do harm by gloomy or anxious looks.

Amer.—Give ergot or ergotine, acetate of lead, tannic or gallic acid, or astringent preparations of iron. A teaspoonful of common salt is often used, and may be frequently repeated. If the bleeding is excessive,

apply cold to the chest, or use an inhalation of a persalt of iron. One or more of the limbs may be surrounded by a ligature in dangerous cases. Ergotine may be injected subcutaneously.

Fr.—In severe cases venesection may be practised, if the patient is robust. Iced acid drinks and pieces of ice may be given frequently. In some cases, nauseating doses of ipecacuanha are of use; in others, a draught of the tincture of krameria or perchloride of iron may be prescribed. Ergot may be injected subcutaneously, or the perchloride of iron may be used as a spray.

Germ.—In severe cases, apply an ice-bag to the chest and let pieces of ice be taken frequently. Ergotine may be given by the mouth, or sclerotic acid injected subcutaneously. Acetate of lead may be used with advantage.

Profuse perspirations are constantly observed in phthisis. They may be present before any other marked symptom of the disease has shown itself, or, what is more general, they only attract attention when the tubercular matter has begun to soften. They may take place at any hour, but are usually most severe when the patient awakes from sleep, at two or three o'clock in the morning. Various measures have been recommended to remove or lessen them. Some advise sponging with vinegar and water or dilute mineral acids, before the patient retires to rest; others that he should take a light meal, along with some port wine, shortly before bedtime. Acids, such as the phosphoric, nitro-hydrochloric, the infusion of roses, are useful, or bark, quinine, or other tonics may be tried. The oxide of zinc (F. 64), which is one of the most useful remedies for this symptom, may be given along with conium, hyoscyamus, or belladonna. You will also often find the subcutaneous injection of atropine ($\frac{1}{60}$ to $\frac{1}{30}$ gr.) each night allay the excessive perspiration, while it helps to relieve the cough. In some obstinate cases the arseniate of iron (gr. $\frac{1}{8}$), picrotoxin (gr. $\frac{1}{200}$), or the solution of strychnine proves useful.

CHAPTER VII.

DISEASES OF THE MOUTH AND THROAT.

Although most of the diseases of the oral cavity are unattended with danger to life, yet the appearances presented by its mucous membrane are most valuable, as indicating the state of the more important parts of the digestive tube. The surface of the tongue is, like all other mucous membranes, liable to erythematous and catarrhal inflammation. In the former it is red and smooth, as you may observe in scarlatina; in the latter there is an increased formation of epithelial cells, and this gives to the tongue a thick white coating, known as a "furred or foul tongue." As this is, however, merely the result of inflammation, it is not necessarily a sign of disorder of the stomach, although it is a constant accompaniment of gastric catarrh. Any inflammation of the oral cavity, such as that produced by an inflamed tonsil, a decayed tooth, or even by tobacco-smoking, may give rise to it. An abnormal colour of the tongue varies according to the cause from which it arises. When yellow, it is ordinarily the result of the inspissation of saliva containing bile, a condition not unfrequent in congestion of the liver and other hepatic disorders. A dark brown or black colour generally indicates an altered state of the blood, and often results from fevers of a typhoid type.

As the greater part of the tongue is composed of muscles, its shape varies according to the condition of the other parts of the muscular system of the body, and often corresponds with the state of the contractile coat of the digestive tube. Thus, when the patient is weak the tongue is usually flabby and soft; in acute gastritis it is sharp and pointed; in chronic gastritis and in atonic dyspepsia a flat and indented margin points to a

slow and feeble motion of the other parts of the alimentary canal. By observing the appearances presented by the mucous membrane and the muscular structure of this, the only exposed part of the digestive tract, the physician is able to surmise the condition of the other portions which are hidden from his view.

SECTION I.

Conditions not necessarily dependent on Organic Disease.

Thrush.

The mouth is liable to parasitic growths on its surface which are known by the name of "thrush." The complaint is most common in the earlier months of childhood, and is especially liable to attack those children who have been brought up by hand. It occurs also during any exhausting illness, such as phthisis and cancer. It usually first makes its appearance on the inner surface of the lips, the angles of the mouth, and the top and sides of the tongue. When a portion of the curd-like material is examined with the microscope, it is seen to be formed of the cells and jointed fibres of a fungus, termed the *Oidium albicans*.

The circumstances tending to produce thrush are—1. An acid state of the saliva. 2. A feeble movement of the tongue, lips, and cheeks, whereby particles of food are allowed to remain in the mouth. 3. A catarrhal affection of the mouth, which is not only a result of the disease, but also may be a predisposing cause of it.

There is no danger from thrush itself, but it indicates a very feeble state of the system, and is, therefore, in many chronic complaints a prelude to a fatal termination. It likewise tends to hasten the death of the patient by rendering him unwilling to take food, on account of the pain that accompanies mastication and swallowing.

Treatment.—Perfect cleanliness is the most important point, both in the prevention and cure of the affection. The mouth should be well wiped out, directly after feeding, with a piece of rag moistened with a solution of borax, chlorate of potassium, or of bicarbonate of sodium, or the glycerine of borax may be applied with a camel-hair brush, or a powder composed of borax and sugar may be dusted on the parts. In the case of adults a solution of salicylic acid (1 in 250 of water) may be used, or the sulphite of sodium, in the proportion of one drachm to an ounce of water, may be employed. If ulcerations are present, they may be dusted with a little powdered alum, or may be touched with a weak solution of nitrate of silver or sulphate of copper. All the vessels in which the food is contained, in the case of a child brought up by hand, should be kept scrupulously clean, and should be often changed. This is especially necessary where india-rubber tubes are used. When the child is at the breast, care must be taken not to let it sleep with the nipple in its mouth, as, in this way, a portion of the milk is often allowed to remain in the oral cavity during the night.

The health of the mother must be attended to, her diet should be regulated, and exercise in the open air prescribed. When she is unable to nurse, a wet-nurse should be provided, if possible; or if one cannot be obtained, asses' or goats' milk may be tried. In most cases the bowels will be found to be disordered, and small doses of grey powder, with rhubarb and bicarbonate of sodium, will be found useful, and if the child appears to be very feeble, a few drops of brandy may be given, three or four times a day, along with its food.

Amer.—In case of children a wet-nurse should be obtained, if possible. The careful removal of the patches by a wet rag, and the use of a solution of borax or bicarbonate of sodium as a wash, is necessary. In adults quinine, iron, wine, &c., should be given.

Fr.—Alkaline lotions should be prescribed, or the glycerine of borax should be used. In some cases, the application of nitrate of silver may be required.

Germ.—The parts should be touched with a brush wet in a solution of borax (1 to 30), or carbonate of sodium (1 to 20). Others recommend solutions of permanganate of potassium, benzoate of sodium, or salicylate of sodium.

SECTION II.

Acute Diseases of the Mouth and Throat.

Oral Catarrh.

Prognosis.—This may present itself either as an acute or chronic condition. It is devoid of danger to life, although it may give rise to considerable pain and inconvenience in mastication and speaking.

Treatment (p. 24).—**A.** The causes of the complaint are numerous, and the most important part of the treatment consists in their removal. In children, it may be often relieved by lancing a projecting tooth; in adults, by the removal of tartar, or by the filing of a sharp projecting edge of a tooth. You must carefully ascertain the habits of your patient. Often, an undue amount of stimulants, or of tobacco, keeps up the complaint, and as soon as the injurious habit is abandoned the inflammation ceases without further trouble. In other cases it is a sign of dyspepsia, and the treatment of the gastric disorder is all that is necessary. Not unfrequently it is the result of syphilis, and then appropriate remedies, such as mercury or iodine, are required.

B. You will find it an advantage, where the inflammation is acute, to use a solution of chlorate of potassium (F. 238) or borax (F. 239) as a gargle. In the more chronic cases, you may have recourse to the application of nitrate of silver in solution (F. 242), or, where ulcerations are present, to chloride of zinc or perchloride of mercury.

D. You should direct your patient to avoid, as far as possible, food requiring much mastication, as well as all stimulants and condiments. In severe cases, you must confine him to a liquid diet, such as soup, beef-tea, and farinaceous food. Unless necessary, on account of syphilis, you should not prescribe mercury or iodine, as these have a tendency of themselves to produce oral catarrh.

Aphthæ.

This used formerly to be confounded with thrush, but microscopic researches have proved the latter to be a parasitic disease, whilst aphthæ are due to inflammation and ulceration of the follicles of the mouth. It is most frequently observed in childhood, during the period of teething, and is rare after five years of age. The prognosis is favorable, as far as the local affection is concerned.

Treatment (p. 24).—**A**. Carefully examine the child's gums, and if any teeth are projecting, use your lancet. In other cases the complaint seems to arise from disorder of the digestive organs, and should be treated by soda and rhubarb, or occasional doses of castor oil. Chlorate of potassium appears to remove some condition of the system that produces the complaint. You may give it in divided doses, up to twenty or thirty grains daily.

B. You attempt to improve the local circulation, in recent cases, by means of a gargle of borax or chlorate of potassium (F. 238). When the disease is of longer standing, you may stimulate the mucous membrane by applying a solution of nitrate of silver.

Amer.—If there is gastric derangement, give mild aperients and antacids. In mild cases, let the mouth be frequently gargled with cold water; in severe cases, with a solution of sulphite of sodium (30 grains to 1 ounce), creasote water, &c.

Fr.—The diet should be digestible, but not stimulating. Apply nitrate of silver to any painful parts.

Germ.—The mouth to be washed frequently with cold water, aud chlorate of potassium given internally. If the spots do not disappear, apply a lotion of sulphate of zinc (5 per cent.). If very painful, touch them with nitrate of silver.

Ulcerative Stomatitis.

Prognosis.—Notwithstanding the threatening appearance of many of these cases, recovery generally occurs.

Treatment (p. 24).—**A**. If the bowels are constipated they should be relieved by suitable aperients, but you had better

avoid calomel and all other depressing purgatives. Chlorate of potassium is believed by many to exercise a specific effect upon the complaint, that is, it seems to remove some obstruction to the healing process. It may be given in three or four grain doses every three hours. When the patient is feeble, cinchona or quinine will be useful, but if there is much anæmia, iron and cod-liver oil will prove more beneficial, and in most cases alcoholic stimulants, such as port wine, may be given with advantage.

B. In recent cases, you must lessen vascular action by the use of a lotion of borax, or you may check the decomposition of adhering particles of food by a gargle of carbolic acid or of the sulphite of sodium (30 grains to one ounce of water). If the case is of a chronic character, a solution of nitrate of silver (five grains to the ounce) will be found more suitable. Occasionally the application of the actual cautery will be found necessary.

Gangrenous Stomatitis or Noma.

Prognosis.—This is exceedingly unfavorable, very few patients recovering. It scarcely ever occurs idiopathically, but usually attacks children who have been weakened by measles or some other eruptive fever.

Treatment.—**B.** The main object is to remove the debility from which the gangrene has arisen. You prescribe quinine, cinchona, acids, or perchloride of iron, and support the child's strength with beef or mutton tea, chicken broth, milk, wine, &c. Some physicians advise the use of turpentine internally. Locally, you try to lessen the fœtor of the gangrenous part by very frequent injections of permanganate of potassium, chlorinated soda (F. 235), or a solution of carbolic acid, whilst carbolic acid is employed as a spray in the room.

Dr. West has advised the use of nitric acid to the part. He says, "I am accustomed to employ the nitric acid, applying it by means of a bit of sponge, or of soft lint or tow, fastened to a quill, while I endeavour, by means of a spoon or of a spatula, to guard the tongue and other healthy parts, as far as possible, from the action of the acid. Some increase of the swelling of

the cheek almost invariably follows the application of this agent, a circumstance that may at first occasion unfounded apprehension lest the disease be worse. Twelve hours, however, must not be allowed to elapse without the mouth being carefully examined, in order to ascertain whether the disease has really been checked, or whether there is any appearance of mortification in the parts beyond the yellow eschar left by the first application of the acid. The cauterisation may now be repeated if it appears necessary, and even though the disease has seemed completely checked, yet reliance must not be placed on the improvement continuing, but the mouth must be examined every twelve hours, for fear the mortification should spread unobserved." Most practitioners prefer hydrochloric acid as an application, and Mansell and Evans recommend the use of a lotion composed of half an ounce of powdered cinchona, two drachms of sulphate of copper, and four ounces of water. Not unfrequently the diseased tissue has to be freely excised, either by the knife or by means of the actual cautery.

Amer.—The diet should be nutritious, and if necessary, iron or quinine, and wine administered. The diseased part should be freely cauterised with hydrochloric acid, nitric acid, undiluted carbolic acid, or the actual cautery. The mouth should be washed out with solution of carbolic acid or chlorinated soda.

Fr.—An anæsthetic should be administered, and the parts destroyed by the Vienna paste or actual cautery. A solution of permanganate of potassium may be used as a lotion to the mouth.

Germ.—All the diseased part to be removed by the thermo-cautery, and the mouth disinfected by means of a solution of carbolic or salicylic acid, or permanganate of potassium.

Salivation.

Prognosis.—This complaint may arise in different ways :—1. Irritation of the gums or teeth is one of the most common causes, and as soon as this is removed, the flow of saliva ceases. 2. The use of mercury or iodine, even in very small doses, will, in many subjects, produce salivation. In such cases, the constitutional peculiarity should be borne in mind when these medicines are required. 3. Irritation of the stomach or

œsophagus, or even pregnancy, not unfrequently causes it, and the prospect of recovery depends upon our ability to relieve the original affection. 4. It occasionally accompanies disease of the nervous system. 5. There are some cases in which no sufficient cause can be discovered. These are often exceedingly rebellious to treatment, but, as a rule, they slowly recover after the lapse of many months.

Treatment.—**A.** The chief point is, of course, to discover the cause, and, if possible, to remove it. In case of diseased teeth, or of a collection of tartar, the irritation arising from them must be obviated. Where disorder of the digestive organs seems to have excited the salivation, appropriate treatment should be resorted to. Constipation has been especially pointed out as tending to produce it, and senna has been strongly recommended as an aperient.

B. Astringent gargles are of use, both in preventing fœtor, and also in restraining the secretion of the glands. Thus, you may employ a solution of tannin, alum (F. 236), chlorate of potassium, sulphate of zinc, or carbolic acid.

C. In very obstinate cases opium has been found valuable. It probably acts beneficially by lessening the excitability of the nervous filaments, and also by diminishing, as in the case of other glands, the amount of fluid excreted. The subcutaneous use of atropine may be also employed, as this drug tends to lessen secretion.

D. All stimulating food should be avoided, as well as condiments, such as pepper, vinegar, and mustard, and, unless required for some special reason, alcoholic drinks should not be taken.

Catarrh of the Pharynx.

Prognosis.—This common complaint occurs in an acute or chronic form. When acute it generally subsides in a few days, unless it has originated from some constitutional disease, such as syphilis. Chronic pharyngeal catarrh, on the contrary, is exceedingly obstinate, producing a constant hawking up of phlegm, especially in the early morning.

Treatment (p. 24).—**A.** In acute pharyngeal catarrh you have

seldom much chance of removing the cause, since, in the majority of cases, atmospheric changes have given rise to it. Where, however, it is associated with enlarged tonsils, you can often prevent the recurrence of attacks by the daily use of a gargle of chlorate of potassium or borax.

B. In most cases the uneasiness is quickly relieved by brushing the inflamed membrane with a solution of perchloride of iron (F. 270), or you may employ a weak solution of nitrate of silver (F. 242). Where there is an objection to this, the patient may use an astringent gargle of gallic acid, sulphate of zinc, or of sulphuric or nitric acid.

Chronic Pharyngitis.

Treatment (p. 32).—**A.** First carefully inquire into the cause. In some cases it results from the irritation of dust, in others from a residence near the sea, or one exposed to the north or north-east winds; or it may have been produced by indulgence in alcohol, or the immoderate use of tobacco. It is wiser for the patient to abstain entirely from these than to attempt to use them in moderation. Syphilis is a frequent cause, and requires the employment of iodine or mercury.

F. In many instances, the regulation of the diet and the removal of indigestion are sufficient to afford relief, and in all cases, these points must be carefully attended to. The bowels should be acted upon by occasional doses of blue pill or calomel, followed by saline aperients, whenever the liver seems to be inactive; if the patient is in a feeble state of health tonics are necessary, but they should be combined with some form of aperient medicine. In children, iodide of iron and cod-liver oil are invaluable.

H. The local employment of stimulants is generally required. Nitrate of silver, chloride of zinc, sulphate of copper, or perchloride of iron may be applied by means of a flat brush to the pharynx (F. 270), or the same remedies may be used as sprays. Sprays are much superior in such cases to gargles, which seldom reach the affected part. Some patients are better able to use inhalations, and those of creasote and sulphurous acid are the best. Various astringent lozenges (F. 253), as of rhatany or

tannic acid, are useful in chronic cases; where the complaint is more recent, those of cubebs or guaiacum are of more value (F. 249).

Phlegmonous Inflammation of the Pharynx (Tonsillitis).

Prognosis.—Notwithstanding the great distress and high fever with which this complaint is accompanied, there is rarely any danger to life. The patient usually gains complete relief as soon as the abscess bursts or is opened by the knife. It not unfrequently happens, that the opposite tonsil inflames after the one first affected has recovered. Cases in which a fatal termination occurred are recorded, but this is very rare.

Treatment (p. 24).—**B.** Formerly, venesection and free leeching were always used, in the hope of stopping the inflammatory process, but this method of treatment is now generally abandoned. When the patient is young and strong and the pain severe, he may derive benefit from the use of a few leeches, as they often lessen, for a time, the acuteness of the suffering. The application to the throat of cloths wet with ice-cold water, or of a Leiter's coil, usually affords more relief in the early stage than the poultices and fomentations generally prescribed. In all cases, it is wise to reduce the arterial tension and diminish the fever by the use of saline aperients, with which you may combine small doses of tartar emetic. Guaiacum has been found useful as an aperient, and may be prescribed, with or without sulphate of magnesium. There is a close relationship between acute tonsillitis and rheumatic fever, and the former not unfrequently precedes the affection of the joints. Whenever you have reason to suspect this, either from the history of previous attacks or from other members of the patient's family having suffered from acute rheumatism, you should prescribe the salicylate of sodium in repeated doses (F. 36). Where there has been no history of rheumatism, we have known ten grains of antipyrin, given every four hours, put an end to the inflammation in one or two days.

When the patient has had repeated attacks, and the tonsil has been left permanently enlarged, the application of a small

blister below the angle of the jaw, at the commencement of the illness, often arrests the inflammation. I need not, however, remind you that blisters ought never to be used if there is the slightest reason to suspect diphtheria, or if the patient is in a low condition of health. Ice is valuable in the early stage, small morsels of it being constantly swallowed; but as soon as severe pain in the ear, or other signs of suppuration, show themselves, gargles of warm liquids are more grateful, and the inhalation of steam, with or without conium or buchu, is then frequently of great service. When you suspect suppuration, let the throat be covered with a large poultice, or frequently fomented with hot water.

C. The severity of the pain would seem to indicate the use of opium, which may be given in moderate doses. The want of rest and food always produces great excitability, which can be relieved by small doses of bromide of potassium, chloral (F. 109), or henbane.

D. As the pain prevents the swallowing of solids, or at any rate makes it very difficult, the patient is necessarily restricted to liquid food. This may consist of milk, beef tea, &c.; but alcoholic stimulants should be avoided. The muscles of the throat are often kept in a state of constant irritation from the large quantity of mucus that obstructs the narrow opening of the fauces. In order to promote the more ready removal of this, and thereby afford rest to the muscular structures, acid or slightly astringent gargles may be employed. Some practitioners prefer the use of sprays of water containing a small proportion of the glycerine of carbolic acid (1 to 60), or of salicylic acid (1 to 100), whilst others advise the application of bicarbonate of sodium, in the shape of a powder, to the inflamed tonsils.

G. As soon as you can detect suppuration, you may open the abscess very cautiously with a bistoury, the blade of which is defended by sticking-plaster near to its point, but usually the abscess bursts of itself.

Amer.—Give guaiacum internally, and also let it be used as a gargle (F. 302). Pellets of ice, frequently swallowed, relieve pain; in other cases, powdered bicarbonate of sodium, dusted on the tonsils, is useful. If there is much fever, one drop of tincture of aconite every hour, until

it reduces the pulse. Pain may be relieved by scarification of the tonsils, or by sprays, or hot inhalations of benzoin, paregoric, hops, chamomile. Rheumatic cases should be treated with salicylate of sodium. Herpetic cases by a spray of borax or bicarbonate of sodium, and by small doses of perchloride of mercury ($\frac{1}{48}$ gr. to $\frac{1}{16}$ gr.), given internally every two hours.

Fr.—In severe cases leeches to the neck; scarification of the tonsils is not of much use. Apply a cold wet compress to the neck, and let pellets of ice be swallowed constantly. If suppuration occur, use the bistoury.

Germ.—Cold compresses externally. Solutions of chlorate of potassium, alum, or borax as a gargle. Scarification of the tonsils relieves pain, and, as soon as pus has formed, the abscess should be opened by the point of a bistoury, defended by sticking-plaster.

Retro-pharyngeal Abscess.

Prognosis.—Most of the cases arise from disease of the vertebræ, and therefore the prospect of recovery depends upon the chance of improvement of the original disorder. Where it follows fevers, or, as occasionally happens, has arisen idiopathically, you may expect favorable results if you can discharge the pus by free opening.

Treatment.—The only point to be attended to is the early and free evacuation of the abscess. This may be effected, as in tonsillitis, by a guarded knife, or, as recommended by Niemeyer, by the nail of the forefinger well sharpened to a point. If the opening is a small one, the nurse should be ordered to press her finger on the sac, in case dyspnœa should afterwards return.

Inflammation of the Œsophagus.

Prognosis.—Catarrh of the œsophagus occurs occasionally, as part of a similar affection of the mucous membranes of the respiratory and digestive tracts. It is unattended with danger, and the symptoms are usually so slight that they may be easily overlooked. It may also result from the swallowing of irritant poisons or from injuries, and the prognosis must then be determined by the nature and extent of the mischief. It sometimes occurs in heart disease, and other conditions affecting the venous system, but, under these circumstances, it is seldom attended

with danger to life. Rare cases present themselves where ulceration of the œsophagus ends fatally, either by the production of hæmorrhage, or by implicating one of the neighbouring organs.

Treatment (p. 24).—**B.** If there should be much tenderness over the œsophagus, it will be wise to apply a few leeches externally, followed by poultices. In slight cases, ice, swallowed frequently in morsels, is likely to be of benefit.

C. Opium, in some form, is usually required. Morphine injected subcutaneously is more likely to be useful than when given by the mouth.

D. In slight cases, the patient must be restricted to liquids, such as milk and beef tea. Where you have reason to suspect ulceration, nutrition must be entirely sustained by enemata.

SECTION III

Chronic Diseases of the Œsophagus.

Stricture of the Œsophagus.

Prognosis.—The cause of the stricture is the main subject for consideration. 1. Where it arises from cancer the prospect is hopeless, for not only does the disease steadily increase, but the neighbouring structures are also apt to be implicated in the new growth. 2. Stricture resulting from the swallowing of corrosive fluids is more hopeful, as there is a greater chance of the treatment by dilatation being successful. 3. If the narrowing is produced by the growth of an aneurism or other tumour, the duration is longer than in cancer of the œsophageal walls, but the termination is equally fatal. 4. In spasmodic stricture of the œsophagus, the prognosis is as favorable as in the other classes it is gloomy. The symptoms not unfrequently commence and terminate quite suddenly.

Treatment.—Dilatation can be successfully employed when the stricture is the consequence of the cicatrisation of an ulcer. In such cases it should be commenced as early as possible and continued for a length of time, the size of the bougie being gradually increased. It is unnecessary in spasmodic stricture, and is injurious when the narrowing is associated with cancer, aneurism, or a tumour compressing the œsophagus. In all cases it is advisable, as long as possible, to keep the patient on a liquid and nutritious diet, such as soup, broth, milk, and farinaceous food. When the power of swallowing liquids is quite gone, and you are unable to pass a tube for the purpose of feeding the patient, you must have recourse to nutrient enemata (F. 281), which may be administered two or three times a day. As a last resource the stomach may be opened, but the operation has been rarely successful.

Treatment of Spasmodic Stricture of the Œsophagus (p. 27).

A. In a large proportion of the cases there have been symptoms of feeble digestion for some time before the attack. Inquire, if the patient is a female, as to the state of the menstruation, and whether she is suffering from leucorrhœa or any other uterine disorder.

F. In most cases the bowels require regulation, and an enema of turpentine or assafœtida is generally useful. As soon as the patient is capable of swallowing, you had better prescribe the decoction of aloes, or some other stimulating aperient, to be taken daily.

H. Until the patient can swallow easily, you will find it the best plan to soothe the nervous system. You may, for this purpose, use morphine subcutaneously, or belladonna, chloral, or bromide of potassium, in enemata. The sucking of pieces of ice often relieves the spasmodic action of the muscles, and thus enables the patient to take food. Occasionally you meet with cases of spasmodic affection combined with catarrh of the œsophagus. In such you must modify the treatment by directing your attention to the symptoms that seem most urgent. After the stricture has been overcome, a course of phosphorus, cod-liver oil, iron (F. 199), strychnine (F. 103), or other tonics should be given.

CHAPTER VIII.

DISEASES OF THE STOMACH.

During fasting, both the muscular and glandular coats of the stomach are at rest; but as soon as food is placed in it, secretion and motion are excited. The most certain way, therefore, by which you can give repose to this organ is to debar the patient from all food, and to maintain nutrition by enemata. To favour absorption by the large intestine, only three or four ounces of fluid should be injected at a time. Before commencing the use of nutritive enemata, the practitioner should ascertain that the rectum is not filled with fæces, and if such should prove to be the case it must be cleared by means of an injection of warm water. After nutritive enemata have been employed for some time it is not unusual for irritation to be set up in the lower part of the intestinal canal. This prevents their being retained, and under such circumstances a few drops of the tincture of opium may be added to each injection.

Instead of employing the ordinary enema syringe, Dr. Brunton advises "that a flexible soft rubber tube should be passed for eight or ten inches up the intestine, and the nutrient enema may be then slowly and gently introduced, either by using a syringe, or by simply pouring it into the tube by a funnel. By this method the fluid is introduced into the sigmoid flexure or descending colon, and if the patient can be propped somewhat so as to lie on his left side, none of it may descend into the rectum. In this case there will be little or no tendency to evacuate it, and the whole may be readily absorbed."

The enema may consist of milk or beef tea, and it is often advisable to mix twenty or thirty grains of pepsin with the former or a few drops of dilute hydrochloric acid to the latter. When

there is much exhaustion, one or two tablespoonfuls of brandy may be also added. The large intestines are unable to absorb soluble albumen, so that the animal broths, so often recommended, are of less value than peptonised or pancreatised materials (F. 293). Fat and starch, although they are incapable of sustaining life alone, may be added in small quantities to other nutrient fluids. Some recommend peptonised milk gruel, but injections of this character are often found to set up irritation in the rectum. Ringer says that "three to five eggs, beaten up with four ounces of a 20 per cent. solution of grape-sugar, forms an excellent nutritive enema." Leube advises that one part of the pancreas of the ox or pig should be rubbed up with three parts of finely scraped meat, together with sufficient warm water to admit of the mixture passing through the enema pipe, and that this may be retained from twelve to thirty-six hours.

Peptonised and pancreatised substances have been formed into the shape of suppositories and introduced into the rectum, but their value as nutritive agents is, according to our experience, much inferior to that of enemata.

As the amount of gastric juice secreted by the stomach is in proportion to the quantity of the food to be digested, you ought to restrict your patient to small and frequently repeated meals whenever you deem it necessary to lessen the activity of the organ. Liquids, such as milk and beef tea, are most suitable; and, if there is no tendency to fermentation, you may also give various kinds of farinaceous food, such as sago, arrowroot, or corn-flour.

Alimentary substances vary greatly as regards the facility with which they are dissolved by the gastric juice. Food is apt to set up catarrh of the mucous membrane when it is long retained in the stomach, and you should, therefore, select what is most easily digested in cases where the gastric secretion is defective. As regards animal food, the more tender the fibre the more quickly it dissolves; consequently mutton is more digestible than beef, and the latter more so than veal or pork. Game, chicken, and the smaller birds agree better with a weak stomach than the goose or duck, as these contain a quantity of oil. The oily fish, such as salmon, mackerel, and herring, are less digestible than the sole, haddock, or whiting. The larger

fish, such as the cod, being hard, are longer in digesting than those that are softer. The facility with which vegetables and fruit dissolve in the stomach depends chiefly on the proportion of cellulose they contain; thus the potato generally agrees better than the turnip or carrot, as these are more woody. Fruit digests more readily when cooked; dried fruits are almost always difficult of solution in the gastric juice, on account of their hardness. Stale bread agrees better with a weak stomach than when it is new, because the former, being dry, absorbs the gastric juice more readily than the latter.

As the first effect of the digestive process is to reduce the food to a state of solution, you will readily understand that it is necessary that every particle should be carefully masticated, especially in old persons and in those suffering from feeble digestion. Not only are the tougher and more fibrous parts broken up by the action of the teeth, and are thereby more readily acted upon by the gastric juice, but the alterations that the starchy materials are intended to undergo are promoted by their admixture with the saliva.

We employ drugs in disorders of the stomach—1. For the purpose of stimulating its secreting and muscular coats. 2. To lessen abnormal irritability and relieve pain. 3. To act chemically upon its secretions or its contents.

The stimulants to the gastric secretion comprise various bitters, which probably act as irritants to the mucous membrane. Indirectly, we can often increase the digestive power by improving the state of the blood or nervous system. It is a common error to prescribe bitters, without first ascertaining whether the loss of appetite, and other symptoms of which the patient complains, are not the results of gastric catarrh. If this is the case, you should first attend to the excretory organs, as an abnormal condition of these is the commonest cause of inflammation of the mucous membrane of the stomach.

The bitters in most general use are gentian, calumba, quassia, cascarilla, chiretta, and cinchona. There is not, excepting in the case of cinchona, much difference in action between them. If the tongue becomes white, the bowels confined, or the patient feverish, whilst taking any of these drugs, it should be omitted. Iron is invaluable where dyspepsia is connected with anæmia,

but its tendency to cause constipation must be remembered, and obviated, if necessary, by combining it with an aperient. Nux vomica is employed where there is debility of the muscular coat of the stomach or intestines. Arsenic, zinc, and other mineral tonics are useful when the deficiency of secretion seems to arise from an enfeebled state of the nervous system.

Sedatives are prescribed whenever there is great irritability of the stomach. The most useful are the alkalies and their carbonates, bismuth, cerium, nitrate of silver, morphine, hydrocyanic acid, and belladonna. The alkalies are of value when the irritability arises from acute or subacute gastric catarrh. Bismuth is given in chronic catarrh attended by an undue secretion of mucus. The oxalate of cerium acts like bismuth, but is less certain in its effect. The nitrate of silver is only of use in very chronic cases, and is chiefly to be relied upon when there is excessive secretion, as in waterbrash. Morphine and hydrocyanic acid are invaluable where there is much pain during digestion, or when vomiting is present, as the result of an irritable state of the mucous membrane.

The drugs which act chemically on the digestive process are very numerous. The principal are pepsin, hydrochloric acid, creasote, carbolic and sulphurous acids, charcoal, and the alkalies and their carbonates.

Pepsin or hydrochloric acid may be given, alone or in combination, shortly after a meal, to supply a deficiency of the gastric juice. Creasote, carbolic acid, and sulphurous acid are useful when fermentation takes place in the stomach, unattended by much acidity. The alkalies and their carbonates may be prescribed whenever acidity is a prominent symptom. Charcoal is chiefly efficacious when the flatulence arises from disorder of the large intestine.

The stomach-pump has been much employed of late years to remove accumulations of undigested and irritating food, and to wash away abnormal secretions from the stomach. In stricture of the pylorus, great relief is afforded by the removal of the retained food ; whilst in chronic catarrh the washing out of the organ tends to prevent dilatation, and thus enables the muscular coat to contract more firmly during the digestive process. In most cases it is sufficient to wash out the stomach every second

or third day, and the patient usually soon learns to perform the operation for himself.

Instead of the pump most practitioners prefer a soft flexible rubber tube, manufactured for the purpose, which removes the contents of the stomach on the principle of the siphon. The tube should be about twenty-five or thirty inches in length, and should have two eyes of sufficient size in its free end. It should be greased with oil or glycerine and passed gently into the stomach, and. if its introduction should excite much retching, the fauces may be painted with a weak solution of cocaine a few



FIG. 8.—Showing the fluid passed into the stomach through the tube (SOULIGOUX).

minutes before it is employed. A funnel should be now attached to the end of the tube, and a pint or a pint and a half of warm water should be poured gently into it. By then bending the tube downwards at the mouth the fluid is sucked from the stomach, and this process may be repeated until the organ is thoroughly washed out (Figs. 8, 9).

Some prefer a fixed reservoir instead of the funnel, the flow into and from the stomach being regulated by alternate compression of the tube below and above the point at which the

supply and escape tubes are united (Fig. 10). In most cases warm water alone is employed, but where there is much mucus



Fig. 9.—Showing the fluid evacuated from the stomach (Souligoux).



Fig. 10.—Showing the method of using the fixed reservoir (Leube).

a solution of bicarbonate of sodium (1 or 2 per cent.) is preferable.

Where much fermentation is present a dilute solution of sulphite of sodium, resorcin, or β-naphthol may be employed.

Valuable as is the washing out of the stomach in gastric disorders, it should be employed with caution. Some patients, who have learned to use it for themselves, pass the tube whenever they feel any uneasiness, and thus do harm by too frequently removing the products of digestion. It should not be used where the patient is very feeble or has suffered recently from hæmatemesis, or if there is any reasonable ground for suspecting the presence of aneurism of the aorta.

SECTION I.

Morbid States not necessarily dependent on Organic Disease.

Acidity.

One of the properties of the gastric fluid is to prevent fermentation. Not only is it, when in a normal state, incapable itself of undergoing this chemical change, but it arrests the process when brought into contact with substances which have already begun to decompose. Various acids are produced by the fermentation of materials composed of starch or sugar, and torulæ present themselves under the microscope. Whenever, therefore, you discover these vegetable organisms in vomited matters, you know that this process has been going on, and that the secretion of gastric juice must have been imperfect. Although a deficiency in the quantity of the peptic fluid, however produced, will give rise to acidity, it occurs most strikingly when particles of food have been long retained in the stomach. Consequently, in chronic catarrh attended by a copious secretion of mucus, and in obstructed pylorus, we find the worst cases of acid fermentation.

It has been much debated whether an increased secretion of acid ever takes place from the mucous membrane of the stomach to such an extent as to produce the symptoms of acidity, independently of fermentation. It is most probable that such

is the case, for an excessive amount of acid is often vomited by persons suffering from the passage of a renal or biliary calculus, when the stomach has been for some time empty.

In whatever way an increased formation of acid occurs certain symptoms are produced: a sour taste and acid eructations are experienced, or heartburn forms the chief subject of complaint, while in many diarrhœa is constantly present. A craving sensation, or a feeling of intense sinking at the epigastrium, relieved by food or stimulants, is another prominent symptom.

Treatment.—In order to remove acidity you should, in the first place, direct your attention to the cause producing it, whether this be gastric catarrh, obstructed pylorus, feeble digestion, or some general disorder of the system, such as gout or rheumatism. Let the diet be composed of substances that will not readily undergo fermentation. The patient should avoid tea, coffee, malt liquors, wines, and soup, as well as food containing an excess of starch. Milk mixed with lime water makes an excellent substitute for the fluids just mentioned, the lime preventing the milk from readily becoming sour. In most cases frequent doses of alkalies, such as liquor potassæ (F. 20), or carbonate of sodium or potassium (F. 22), give relief, both by neutralising the acidity, and also by stimulating the peptic glands to an increased secretion of the digestive fluid.

In chronic cases, and especially when there is a craving sensation relieved by food, a mixture containing bismuth and magnesia will be found useful, and where it is associated with excessive flatulence a small dose of charcoal often proves of value. The bowels require careful regulation. In many cases they are at first relaxed, but as soon as the acidity diminishes constipation is complained of. Mercurial preparations are generally required, and may be given in the form of calomel or Pil. Hydrarg.; but if the tendency to diarrhœa is well marked, the Hydrarg. cum Cretâ will be found to answer better.

Flatulence.

The stomach ordinarily contains a certain amount of air, partly swallowed, partly the result of chemical changes in the food. An excessive accumulation of gas may arise from atony

of the muscular coat, allowing the food to remain in the stomach for an undue length of time, and thereby rendering it more liable to decomposition, or it may accompany chronic inflammation of the mucous membrane. Again, the gas may become mixed with sulphuretted hydrogen, produced by the decomposition of the nitrogenous materials of the food or bile.

Flatulence, in addition to the discomfort it occasions, may give rise to various sensations very alarming to the patient. It sometimes induces severe attacks of spasmodic pain attended by fainting, and, in hysterical females, it often causes a feeling of choking, the result of spasm of the œsophagus. Palpitation, accompanied by dyspnœa and irregular or intermitting action of the heart, is another common result of an accumulation of gas. This is most apt to occur when the muscular structure of the heart is enfeebled by dilatation or fatty degeneration.

Treatment.—**A.** You must first ascertain what is the state of the stomach that prevents the due secretion of the gastric juice, and direct your attention to remove it. Thus in atonic dyspepsia you may prescribe acids (F. 210), or pepsin, shortly before a meal, or sulphurous acid between meals, so as to destroy any torulæ that may remain in the stomach; or, if it is associated with a flatulent state of the colon, you may give charcoal. Whenever there is much acidity or heartburn, acids must not be given after food. In most cases of a chronic character, nux vomica or strychnine is useful. In inflammatory dyspepsia, you will find alkalies combined with carbolic acid or creasote advantageous; in cases where there are eructations of sulphuretted hydrogen, a mineral acid before each meal (F. 210), with charcoal, either alone or combined with magnesia, or the bicarbonate of sodium, an hour or two afterwards, is most efficacious.

The patient should avoid all substances that are especially apt to ferment, such as tea, coffee, soup, vegetables, fruit, wines, and malt liquors. He should be restricted as much as possible to solid food, and abstain from effervescing liquids; but a tumblerful of hot water an hour or two after food often affords great relief.

To any drugs you may prescribe you will generally have to add stimulants, such as the aromatic spirit of ammonia,

chloroform, valerian, peppermint, or cinnamon. In employing aperients select those that act fully (F. 155) but do not excite the intestines to frequent efforts. Avoid saline aperients, or if it be necessary to use them, let some stimulant or carminative be added.

Waterbrash.

Patients affected with waterbrash experience a severe spasmodic pain at the epigastrium, often attended by a feeling of constriction, which is immediately relieved by the rejection of a clear, watery fluid. It does not necessarily indicate any structural disease of the stomach, although anatomical changes have been sometimes discovered after death at the pylorus. The complaint is generally curable, but it is very apt to recur. A sudden and excessive flow of saliva is not uncommon in gastric disorders, and this is often confounded with waterbrash. The former is, however, unattended by pain, and the liquid that flows from the mouth has the ordinary physical and chemical characters of the salivary secretion.

Treatment.—**A.** You should first prohibit all food likely to give rise to irritation, such as oatmeal, brown bread, and other substances of a like nature. The giving up of such articles of diet and of alcoholic liquors will, in many cases, suffice to cure the complaint.

Where the regulation of the diet is not efficacious you must have recourse to astringents, such as bismuth (F. 25), zinc (F. 64), kino, logwood, or tannic acid. Opium is always of use, and may be combined with any of the above. In very chronic cases the oxide or the nitrate of silver is often more valuable than any other astringent (F. 52). Where there is nausea or vomiting after food, the waterbrash is best treated by the exhibition of a mineral acid shortly after eating.

Vomiting.

No symptom more frequently proves rebellious to treatment than vomiting. Not only is it the most common accompaniment of various gastric disorders, but it constantly presents itself in the course of other diseases. When, therefore, you are

called to a case of vomiting, you have first to ascertain whether it is an indication of disease of the stomach, or of some other organ. In adults, always remember to examine the state of the kidneys; and bear in mind that attacks of uncontrollable vomiting occasionally take place in the early stages of locomotor ataxia. In children, very carefully investigate the condition of the brain. Where the vomiting is not dependent on gastric disorder, the treatment must, of course, be directed to remove the disease that has occasioned it.

The most common causes of vomiting in disorders of the stomach are—1. Nervous irritation. 2. Fermentation of the food. 3. Acute catarrh of the stomach. 4. Chronic catarrh of the stomach.

Treatment.—In *vomiting arising from nervous irritation* the rejection is usually sudden, often violent, and takes place immediately, or very shortly after the taking of food or drink. What is rejected is slightly sour, or in the same state in which it had been swallowed, and the microscope shows in it no traces of torulæ or sarcinæ. If mucus be present, its quantity is small, and it is unaccompanied by blood. It is in this kind of vomiting that sedatives are so especially useful. Morphine, either internally or subcutaneously, is invaluable: atropine, hydrocyanic acid (F. 176), and laurel water were formerly the chief remedies, but chloral or bromide of potassium (F. 114) may also be given, alone or combined. Ringer advises the administration of one drop of Vinum Ipecacuanhæ every hour in the vomiting of pregnancy. Where the tongue is coated with a creamy fur he thinks nux vomica is more useful than ipecacuanha. A small blister to the epigastrium, with morphine (half a grain) sprinkled on the raw surface, is generally of use. Restrict your patient to pieces of ice, milk and lime water, beef or mutton tea, in small quantities and often repeated. When the vomiting seems to be accompanied by exhaustion, brandy and soda water, champagne, or an enema of beef tea and brandy are especially useful.

"*Hysterical vomiting*" arises from nervous irritation. It is very intractable, and seems often more a habit than a disease. The patient rejects a part of every meal, often before she leaves the table, but has no pain, and does not lose flesh. It is best

treated by carbonate of iron, quinine (F. 215), strychnine (F. 226), and other tonics, by fresh air and sea bathing, or by shower-baths. The bowels should be carefully regulated with aloes (F. 155), or by enemata. In some instances feeding the patient every three hours is of more value than the use of drugs, and in extreme cases she should be fed by means of the stomach-tube. A somewhat similar kind of vomiting often occurs in phthisis. It may be relieved by giving a dose of morphine and hydrocyanic acid shortly before a meal (F. 176), or by the frequent application of small blisters to the epigastrium. Acids, along with calumba, are often of value between the meals (F. 210). Alum, in six to ten grain doses, sometimes checks the vomiting that occurs in phthisical patients from continued coughing; in other cases nux vomica will be found more useful.

Vomiting resulting from fermentation usually occurs at longer intervals than that just described. It is often accompanied by a sensation of burning at the chest and by distressing flatulence. The fluids rejected are acid, hence the sour smell; they are often green in colour, and under the microscope are seen to be loaded with torulæ. In such cases you should ascertain if there is any obstruction at the pylorus producing dilatation of the stomach. In vomiting arising from fermentation you must prescribe carbolic acid (F. 31), creasote, sulphurous acid, resorcin (3—5 grains) or β-naphthol (1—3 grains); and if there be great acidity, alkalies (F. 34). The diet should consist of liquids that do not readily ferment, such as milk and lime water, beef tea, and mutton tea. All starchy and saccharine materials must be prohibited. Alcoholic drinks usually add to the mischief, and should be avoided. No benefit is derived from sedatives.

The *vomiting in acute gastric catarrh* is usually violent, very frequent, follows almost directly the use of food, and occurs even when fasting, from the irritation excited by the mucus. The mucus rejected is thick, ropy, and often streaked or mixed with blood; there is usually also some tenderness of the epigastrium. In such cases you must avoid all medicines, except two or three grains of calomel sprinkled on the tongue, so as to act upon the bowels; a quarter of a grain, given every three hours, is sometimes more efficacious than the larger dose. If the

tenderness is severe, and there is no contra-indication, the application of a few leeches to the epigastrium, followed by a poultice, will generally relieve the nausea and vomiting. Where you cannot employ leeching, you may use dry cupping or hot poultices, or fomentations with hot water. In severe cases all food must be forbidden, and the patient should be confined to pieces of ice, which he may suck from time to time, and if requisite, the strength may be supported by enemata of beef tea. In cases of less severity, you may give a tablespoonful of milk every half-hour, or an equally small amount of beef or mutton tea, or you may try frequent and small quantities of koumiss or buttermilk. In some instances a tumblerful of hot water, repeated every two or three hours, gives relief, and in others a weak, hot infusion of chamomile is more efficacious. Where the vomiting has proved very obstinate, I have seen the use of the stomach-tube relieve the retching by the removal of the irritating mucus.

The *vomiting in chronic gastric catarrh* usually occurs only at intervals, not unfrequently at the same hour each day, or after some particular meal. In addition to the food, a large quantity of thick mucus is rejected. In some instances the quantity of this is enormous. In all cases, the first and most important point is to secure a free and regular action of the bowels. When the vomiting is frequent bismuth is invaluable (F. 25). Students generally look upon this drug as a specific for vomiting, but this is quite a mistake; it is useless where it arises from fermentation, and injurious in that dependent on irritation or acute gastric catarrh. You may also use oxide of zinc (F. 64), oxalate of cerium, or lime water. Where the mucus is excessive the oxide or nitrate of silver (F. 223), acetate of lead (F. 61), tannic acid, and other astringents are of great service. In obstinate cases the stomach should be washed out with warm water or a weak solution of bicarbonate or sodium (1 or 2 per cent.) every few days. In the vomiting of drunkards the use of one drop of arsenic, shortly before meals, is strongly recommended by some practitioners. The diet must be conducted according to the rules laid down for chronic gastric catarrh.

The presence of bile in the fluids rejected from the stomach furnishes us with no indication for treatment, for continued vomiting, however produced, causes the contents of the gall-

bladder and ducts to flow into the stomach. Nevertheless, where bilious vomiting has persisted more than twenty-four hours, and the fluid has an alkaline reaction, you will often find the dilute sulphuric acid, repeated every two or three hours, stop it.

Hæmatemesis.

This is always an alarming and dangerous occurrence. 1. It most frequently arises from an ulceration of the stomach or duodenum perforating a blood-vessel; in other instances the bleeding takes place from congestion of the mucous membrane in the vicinity of a simple or cancerous sore. In rare cases the ulceration is situated in the œsophagus. 2. From congestion of the vena portæ or its branches, as in chronic atrophy of the liver and hepatic congestion. 3. From an alteration of the blood, which allows it to transude through the vessels; in this way hæmatemesis occurs in acute yellow atrophy of the liver, scurvy, splenic disease, chronic atrophy of the kidneys, &c. You must bear in mind that there may be extensive bleeding into the digestive canal, with little or no vomiting of blood. When, therefore, you find a patient who has become suddenly anæmic without any apparent cause, you should suspect hæmorrhage into the stomach or intestines, and carefully examine the stools for the pitchy appearance indicative of partially digested blood.

Prognosis.—This depends upon the amount of blood lost and the power of the patient to sustain it, and on the probability that the hæmorrhage can be stopped. For instance, the prognosis will be more favorable in the case of a simple than of a cancerous ulcer, because you are more likely to be able to restrain the bleeding from the former than the latter. In simple gastric ulcer, the first attack of hæmatemesis is rarely fatal, but in chronic cases, in which the tissues often become so thickened that retraction of the injured vessel is difficult, you may fear a fatal termination. Congestion of the liver, although it may produce excessive bleeding, usually ends favorably, but you should always regard as a dangerous symptom severe gastric hæmorrhage occurring in drunkards. These bear the

loss of blood badly, and it seldom takes place until the liver has suffered serious injury from cirrhosis.

Treatment (p. 24).—**B.** In severe cases an ice-bag may be applied to the epigastrium, but the effect of this should be carefully watched, lest the action of the heart become too much depressed. Where portal congestion is the cause of the hæmorrhage, you are often advised to give a saline aperient along with an acid, but it is wise to defer this until you ascertain how far the hæmorrhage has proceeded, and what effect it has produced upon the heart.

In slight cases the mineral acids, such as the sulphuric (F. 48), may be alone necessary; but in those that are more severe, gallic acid (F. 45), alum (F. 50), tannic acid, acetate of lead (F. 60), or the oil of turpentine (F. 63), may be used. If the bleeding has arisen from ulceration, you may inject ergotine subcutaneously.

In severe cases you must have recourse to stimulants, and may use ammonia to the nostrils, give brandy in an enema, or you may apply ligatures or bandages to one or more of the limbs, so as to prevent the free return of the venous blood to the heart. It is better to avoid the administration of alcohol by the mouth, as it is apt to produce vomiting, which may increase the bleeding. In extreme cases transfusion of blood may be required.

D. Insist upon perfect rest in bed, as the hæmorrhage often goes on, without any indication, until fainting is produced; it is always wise, therefore, to keep the patient in the recumbent position, until all fear of a recurrence has passed away. The room should be cool, and all food and drink must be forbidden, excepting small pieces of ice, which may be placed in the patient's mouth from time to time. Abstinence from food ought to be enforced until the bleeding has entirely ceased, and the strength of the patient should be supported by nutrient enemata. You may afterwards allow small quantities of beef-tea or milk, either iced or cold, at frequent intervals.

Amer.—Use an ice-bag to the epigastrium, and let the patient swallow, from time to time, particles of ice. Ergotine may be used hypodermically. The best styptics are alum whey and gallic acid. If the case is severe, elastic ligatures may be applied to the upper part of one or more of the

limbs. If brandy is necessary, let it be given hypodermically or by the rectum. In very bad cases use transfusion.

Hiccough.

This often arises from a slight irritation of the stomach, but when accompanied by signs of a failing heart, it indicates great danger to life. It occasionally occurs without any other symptom, and produces exhaustion, in some instances even death. Such cases chiefly take place in old people who have previously suffered from gout, or who are affected with chronic kidney disease.

Treatment (p. 27).—**A.** It is advisable to give a dose of calomel, followed, if necessary, by some warm aperient, such as the decoction of aloes, or the compound powder of rhubarb (F. 141), for the purpose of removing any undigested material that may have given rise to irritation in the intestinal canal.

B. The patient is often so much exhausted that ammonia, or brandy, is required.

C. In order to afford relief, you must chiefly trust to the employment of sedatives. Chloral (F. 108) often checks the hiccough, at any rate for some hours, and may be followed by frequent doses of bromide of potassium, ether, and morphine. Morphine, given subcutaneously, is very beneficial, in case there is no co-existing atrophy of the kidneys. Some recommend musk as a stimulant to the nervous centres. The application of a mustard poultice to the epigastrium is useful, and in severe cases a blister should be applied.

Gastric Neuralgia.

Although pains of a neuralgic character are common in the epigastric region, neuralgia of the stomach itself, independent of organic disease, is of rare occurrence. You frequently meet with very severe cases of intercostal neuralgia in the female, the pains being aggravated at the catamenial periods, and also with rheumatism of the upper part of the abdominal muscles. Occasionally you are consulted for neuralgia of the epigastric region, resulting from disease of the spinal bones or cord, or

from an aortic aneurism. Neuralgic pains in the epigastrium are also produced by gall-stones, colic, and deeply seated tumours. We are, however, justified in considering as neuralgic cases in which, after the tenderness over a gastric ulcer has disappeared, the vomiting has subsided, and the patient has gained flesh and strength, severe pain has returned, and is not restricted to the time during which digestion is going on. Under such circumstances a more liberal diet, with the use of iron and other tonics (F. 199) and of stimulants, often rapidly relieves the suffering of the patient. Of all the various tonics, arsenic is perhaps the most useful, and if it does not succeed in removing the pain, strychnine may also be employed (F. 102). Some advise the use of galvanism for these cases. The continuous current answers the purpose best, and should be employed frequently, but the current should be weak, especially at first.

SECTION II.

Acute Diseases of the Stomach.

Acute Gastric Catarrh.

Prognosis.—Uncomplicated gastric catarrh almost always terminates favorably. When, however, it accompanies chronic kidney disease, dilated heart, or some other serious malady, it not unfrequently hastens the fatal termination by the exhaustion it produces. Where the whole gastro-intestinal canal is affected, as is so often the case in infants, the patient frequently sinks from the effects of the vomiting and diarrhœa.

Treatment (p. 24).—**A.** You rarely have the power of removing the cause, as it has generally ceased to act before you see the patient. Where there is an escape of fœtid gas from the stomach, where particles of food are still found in the vomited matters, after repeated vomiting, or if there are frequent and ineffectual attempts to vomit, an emetic of ipecacuanha or zinc is advisable. In most cases it is necessary to clear the intestinal canal of any

irritating materials that may be present. You therefore place on the patient's tongue four or five grains of calomel if an adult, or one or two grains in the case of a child, so as to secure a free action of the bowels. It may be necessary to repeat the dose; or, where diarrhœa is present, you may give one grain, or even a quarter of a grain, every three or four hours with advantage, or you may combine the calomel with bismuth and bicarbonate of sodium. As soon as the vomiting subsides, you must keep up a slight purgation, either by the use of enemata or by a few doses of the sulphate or citrate of magnesium (F. 146).

B. Where there is much epigastric tenderness and the pulse is tolerably firm, the application of a few leeches often affords immediate relief. If you think the removal of blood not advisable, dry cupping may be used. In all cases keep the epigastrium covered with fomentations or a large hot poultice.

C. After the inflammation has subsided, the vomiting may be kept up either by nervous irritation or exhaustion. In the former case use sedatives, such as opium, in the form of a pill, or morphia and hydrocyanic acid (F. 176); in the latter it may be necessary to prescribe small doses of brandy or champagne.

D. Insist on perfect rest in bed. In severe cases it may be necessary to withdraw all food and restrict the patient to ice for twelve or twenty-four hours. In milder attacks you may allow small quantities of milk, mixed with seltzer or soda water; or, if there is much acidity, with lime water. Others prefer weak mutton or beef tea, or peptonised foods. Unless the state of the pulse requires alcoholic stimulants, it is better to avoid them.

B. *Amer.*—In mild cases give ipecacuanha (six or eight grains) three times a day, and if necessary, calomel, followed by a saline aperient. Hot fomentations or poultices to the epigastrium.

Fr.—Small doses of tartar emetic, with or without ipecacuanha, in severe cases. This should be followed by saline aperients.

Germ.—If the stomach is overloaded, an emetic, or the subcutaneous injection of $\frac{1}{6}$ gr. of apomorphia to excite vomiting.

C. *Amer.*—If there is much pain, small doses of opium or hydrocyanic acid. If diarrhœa, bismuth and bicarbonate of sodium. In slight cases effervescent medicines with hydrocyanic acid.

Germ.—Small doses of dilute hydrochloric acid (5 to 10 mins. in 4 oz. of water). If vomiting is obstinate, small pieces of ice may be taken.

D. *Amer.*—In dangerous cases, withdraw all food by the mouth, and let the patient's strength be maintained by nutrient enemata. In slighter cases, milk with Vichy water or lime water. Ice may be taken frequently.

Fr.—Rest is necessary ; acid drinks and laxatives may be prescribed.

Ulcer of the Stomach.

Prognosis.—Gastric ulcer may present itself as an acute or chronic disease. Notwithstanding the severe pain and constant vomiting that so often accompany this complaint, it is rare for death to occur from exhaustion. Usually a fatal termination is due to hæmorrhage or to perforation of the peritoneum. Hæmatemesis is rarely fatal on its first occurrence; it is more apt to destroy life when the ulcer has extended deeply enough to lay open a large blood-vessel. Perforation is almost invariably followed by death from the peritonitis it sets up. As a general rule, a gastric ulcer in young people, if properly treated, is likely to heal quickly ; in the old its course is generally tedious, and in many cases the symptoms recur from time to time after a cure has apparently taken place.

Treatment (p. 30).—**A.** You have but little power of preventing the extension of the disease by the treatment of its causes. When there is reason to believe it has arisen from intemperance, indulgence in alcohol must be prohibited. In some old cases a history of syphilis can be obtained, and then a course of iodide of potassium is invaluable, and sometimes removes the complaint when every other method of treatment has failed.

B. Whenever there is much tenderness on pressure, and the patient is tolerably strong, the occasional application of a few leeches gives great relief. The epigastrium should be covered with a hot poultice whether leeches are used or not. Some advise ice-bags, but poultices are generally more agreeable to the patient. In chronic cases small blisters should be frequently applied over the seat of the pain, and if the suffering be severe the raw surface may be dressed with morphine.

C. In almost every instance opium is required, half a grain or

one grain being given three or four times a day. When the pain is very violent morphine may be used subcutaneously, but it is better to give it by the mouth, as it thereby comes directly into contact with the ulceration. In chronic cases you may combine it with bismuth and magnesia (F. 26). The bowels should be kept open if necessary by enemata, but all drastic purgatives must be avoided, as they are apt to increase the action of the stomach as well as that of the intestines.

It is generally recommended that the stomach-tube should not be used in cases of gastric ulcer, especially where hæmorrhage has recently taken place; we have, however, seen the washing out of the stomach give great relief, and apparently assist in the healing of the ulcer when the case was of a chronic character, and where the food was long retained in the organ.

D. Rest in the recumbent position is essential in all acute or recent cases. This is often sufficient of itself to relieve both the pain and vomiting. But you must also insist on physiological rest of the organ, which should be persisted in until all urgent symptoms have disappeared.

E. For food you should select milk, milk-and-water, or weak broth, so as to excite as little secretion of gastric juice as possible, or you may prescribe peptonised or pancreatised foods (F. 290); if there is much acidity you may add lime water or bicarbonate of sodium to the milk. As the patient improves the liquids may be thickened with macaroni, vermicelli, or semolina. Afterwards, rusks, light puddings, and eggs; and, finally, fish, sweetbread, softly boiled tripe, chicken, or game, may be tried before you allow the patient to venture on mutton or beef. When the symptoms are acute, you ought to limit him to small quantities of liquid at a time, such as one or two tablespoonfuls, often repeated. This is necessary because perforation and hæmorrhage are most apt to follow distension of the stomach, and therefore you should endeavour to keep it as empty as possible until all urgent symptoms have disappeared.

B. *Amer.*—A few leeches to relieve pain; at a later period, blisters or liniments of croton oil.

Fr.—Blisters or liniments of croton oil often relieve pain.

Germ.—Hot poultices to the epigastrium.

C. *Amer.*—To relieve pain, give opium, but codcia is often more useful. Iron should not be prescribed in the early stages.

Fr.—If vomiting persists, give creasote or three or four drops of tincture of iodine, well diluted. If acidity is present, prescribe alkalies.

Germ.—If pain is severe, give opium, or morphia subcutaneously, and in the later stages, nitrate of silver may be tried. Gerhardt advises, for the relief of pain, three or four drops of solution of perchloride of iron, well diluted. Excessive vomiting requires morphia, bromide of potassium, or chloral. A dose of Carlsbad salts, each morning, is said to be beneficial.

D. *Amer.*—Milk and Leube's beef solution. If milk causes acidity, add bicarbonate of sodium or lime water (a quarter to one half in bulk) peptonised milk, with a soft-boiled egg may be used. In bad cases the patient should be fed by the rectum.

Fr.—Milk, or milk and lime water, or buttermilk.

Germ.—Milk with soft-boiled egg, or thoroughly soaked bread; or the meat solution of Leube-Rosenthal. If it is advisable to use the stomach-tube, the washing of the stomach should be conducted with great caution.

SECTION III.

Chronic Diseases of the Stomach.

Dyspepsia.

This complaint is not only important on account of its frequency, but because it occurs as a complication of so many affections of other organs. We have already seen that attention to the nutrition of the patient is of primary importance in all chronic diseases, and you have, in such cases, to ascertain how far the gastro-intestinal canal is capable of digesting the food presented to it. It cannot be too often impressed upon the mind of the practitioner, that the *quantity* of the food that is taken into the stomach of a patient is not so important as the amount that can be dissolved, absorbed, and assimilated.

The symptoms of dyspepsia arise from an imperfect secretion of the gastric juice; consequently any circumstance that

lessens the activity of the stomach is capable of giving rise to it. Practitioners have long recognised two varieties, viz. *inflammatory dyspepsia*, or chronic gastric catarrh, and *atonic dyspepsia*. In the latter the derangement consists only in a feeble state, either of the secreting or motor apparatus of the organ. One great difficulty in practice arises from the fact that these two conditions, which require very different treatment, often alternate with each other. A person may be affected with chronic catarrh of the gastric mucous membrane, which, on its subsiding, leaves an enfeebled state of the organ; or a patient liable to weak digestion may be attacked by the inflammatory form of dyspepsia, because the food has been retained too long in contact with the mucous membrane. You have, therefore, to watch the symptoms of the patient, and adapt your treatment to the condition in which the stomach may be at the time you are called upon to prescribe.

The discrimination of the slighter cases of inflammatory dyspepsia from those of atony of the stomach is often a matter of great difficulty, but it is easy to distinguish them when the symptoms are well marked. In chronic gastric catarrh there is rarely much pain directly after eating, though a burning or craving sensation often occurs two or three hours afterwards, relieved temporarily by food or stimulants. In atonic dyspepsia the food is generally said "to lay heavy at the chest," and there may be severe suffering directly after food, from an accumulation of flatus which is relieved by eructation. In the former there is usually a certain amount of tenderness on pressure, in the latter none. Acidity is a common symptom in gastric catarrh, it is rare in feeble digestion; whilst flatulence is more generally complained of when the symptoms arise from atony. In inflammatory dyspepsia the tongue is foul, often yellow, and the taste offensive in the morning; these are usually absent in the latter form of the disease. Nausea and vomiting are common in catarrh, rare in atonic dyspepsia. The bowels are often relaxed, and the urine high-coloured, with a deposit of lithic acid or the lithates, in gastric catarrh; it is clear, light-coloured, and deposits the oxalates or phosphates, and the bowels share the torpor of the stomach, in feeble digestion.

Chronic Gastric Catarrh, or Inflammatory Dyspepsia.

Treatment (p. 30).—**A.** The discovery of the cause is the most important point, because, where you can remove it, the inflammation will usually subside. Ascertain, therefore, if the patient is a sufferer from disease of the heart, liver, or kidneys, since these morbid conditions are frequent causes of this form of dyspepsia. If these organs are sound, go carefully into the history of the patient with respect to gout and rheumatism, as the complaint very often arises from these maladies. In other instances you may trace it to too frequent meals, or too much animal food; still more often to indulgence in alcoholic liquors, or an insufficient amount of bodily exertion.

F. The food should be of a digestible character; it must be taken in small quantities, and the meals ought not to be too frequent. In severe and intractable cases a milk diet is often successful. Some patients are unable to digest new milk, and, under such circumstances, it may be given in the peptonised or pancreatised form, or it may be mixed with lime water, or be taken as "skimmed milk." After two or three weeks' restriction to milk, stale bread, toast, or rusks may be tried, along with soft-boiled eggs and well-cooked rice, and if they succeed, fish, followed by chicken or game, may be allowed. It is often an advantage to restrict the amount of fluid at meals, but to give a tumblerful of hot water about one hour after the food has been taken. This is chiefly of use when the urine is loaded with lithates; when these have disappeared, a few drops of dilute hydrochloric acid may be added to the water. As a general rule, you should forbid alcohol.

The chief point is to ascertain if there is any hepatic congestion, and, if so, to remove it. In severe cases you may give occasional doses of calomel (F. 161) or blue pill (F. 160), or, in those of a gouty habit, colchicum (F. 13) assisted by some alkaline saline aperient, such as Carlsbad salts or the sulphate and carbonate of magnesium (F. 148). Where the symptoms are less urgent soda and rhubarb (F. 142) or liquor potassæ (F. 20), together with a pill of podophyllin (F. 162) or leptandrin at night, will generally prove sufficient. Bismuth enjoys

a great reputation in this complaint (F. 25). It is most useful when the more urgent symptoms have subsided and the patient complains of nausea, pain, or occasional vomiting, with distension after food, and other signs of dyspepsia. Remember that bismuth is an astringent, so that aperients are generally required along with it.

In very chronic cases the nitrate of silver ($\frac{1}{6}$ to $\frac{1}{3}$ gr.) or the oxide of silver may be given in the shape of a pill half an hour before food. Where large quantities of mucus are vomited astringents are required, such as bismuth, oxalate of cerium, or kino. In all chronic and severe cases the regular washing out of the stomach, once or twice a week, will be found to be useful by removing the mucus from the surface of the organ, and thus assisting the secretion of the gastric juice.

F. *Amer.*—In severe cases, a diet consisting of milk may be tried for about three weeks, or peptonised or pancreatised food may be given. Afterwards, soft-boiled eggs, stale bread, well-cooked rice, followed by tender meat; but farinaceous food must be forbidden. Not much liquid should be taken with meals, but a pint of hot water in the morning, fasting, to be repeated an hour before each meal, or, in other cases, some mucilaginous fluid may be drunk one hour after food, and, if desirable, a few drops of mineral acid may be added to it. Saline aperients, assisted by small doses of calomel, may be prescribed. Where large quantities of mucus are vomited, bismuth, kino, oxalate of cerium, with small doses of opium, may be used. In chronic cases, bismuth or bicarbonate of sodium, with small doses of calomel ($\frac{1}{5}$ gr.), are of use. In others, nitrate of silver ($\frac{1}{4}$ gr. to $\frac{1}{2}$ gr.) may be given before each meal. Where there is reason to suspect constriction of the pylorus, the stomach-tube should be employed. Where great acidity is present, alkalies or magnesia are required.

Fr.—In severe cases let the patient be restricted to a purely milk diet, or to milk and light broths. The meals should be frequent, small in quantity, and chiefly composed of animal substances. If there is much tenderness at the epigastrium, a few leeches may be applied, or counter-irritation excited by blisters or croton-oil liniment. If vomiting is frequent, an emetic of ipecacuanha is of use. When the digestion is feeble and not accompanied by much flatulence, we may give gentian, calumba, or nux vomica. Where there is no particular indication as to the use of alkalies or acids, nitrate of silver may be prescribed. If there is reason to suspect narrowing of the pylorus, the stomach-tube should

be used. If acidity is a prominent symptom, bicarbonate of sodium, magnesia, or lime water may be given; but if not much acidity, small doses of hydrochloric acid will be found useful. When there is much distension after food, charcoal, bicarbonate of sodium, magnesia, or bismuth, or if there is evidence of decomposition, creasote (½ to 1 min.), or salicylic acid.

Germ.—If the disease has arisen from cardiac, pulmonary, or hepatic disease, these must be treated. As regards diet, avoid alcohol, the coarser kinds of vegetables and fruits, all dishes very sour, salted, or highly spiced, as well as potatoes, farinaceous and fatty articles of diet. Best kind of food—milk, soft-boiled eggs, beef tea, calf's brains, sweetbread, pigeon, chicken, thin shavings of raw beef or ham, white bread. Mild laxatives should be prescribed, such as the alkaline mineral waters. Bismuth or nitrate of silver may be used, or, if the appetite is bad, gentian, calumba, or nux vomica. Condurango bark is well suited for these cases. In bad cases the stomach-pump must be employed. Acidity requires bicarbonate of sodium or magnesia. To check fermentation, salicylic acid (10 to 15 grs. daily), creasote (½ min.), or twenty drops of benzine in water or milk, several times a day.

Feeble Digestion, or Atonic Dyspepsia.

Treatment.—**A.** The chief causes of this form of indigestion are—1. Anatomical alterations in the secreting structure of the stomach, such as occur after attacks of chronic gastric catarrh. 2. A deficiency in the amount or quality of the blood. Thus dyspepsia constantly shows itself after excessive menstrual discharge, leucorrhœa, miscarriage, or long-continued suckling, in the female, whilst in the male bleeding piles, insufficient nourishment, or too much liquid food are common causes. 3. An exhausted state of the nervous system leads to atonic dyspepsia by lessening the activity of the secretion or impairing the movements of the stomach; consequently it is produced by care in business, anxiety, and mental distress; or it may originate from excessive tobacco smoking or debauchery. 4. One of the most common causes is the neglect of a sufficient amount of exercise by persons immersed in the cares of business; and under such circumstances a sea voyage or travelling will often at once restore the tone of the digestive organs.

F. Carefully regulate the diet. The patient should avoid

soups, made dishes, raw vegetables, and hard and indigestible food of all kinds. Do not allow much liquid with the meals, and see that they are moderate in quantity, and composed of easily digested and nutritious articles of diet. Many cases require some form of alcohol, but this point must be determined by the previous habits of the patient and the other circumstances of his case.

Take care that the bowels act regularly, for unless the muscular motion is maintained in the lower parts of the digestive tract that of the upper is sure to be sluggish. Avoid all irritating and exhausting purgatives, and if it be necessary to employ saline aperients add to them some tonic, such as quinine or gentian.

H. Tonics are almost always required. Where the fault consists in feebleness of the secreting structures, as often occurs after repeated attacks of catarrh, you will find acids (F. 210) most useful, and they may be combined with strychnine or some other vegetable bitter. The hydrochloric is most generally employed, but the lactic, phosphoric, or nitro-hydrochloric acid may be prescribed if there is any reason for the preference. They are most useful when given two or three hours after food. In some cases a small quantity of ipecacuanha ($\frac{1}{4}$ gr. to $\frac{1}{2}$ gr.) given shortly before food increases the digestive power more than acids. Pepsin may be had recourse to in most cases with benefit. Where the blood is deficient iron is especially valuable, and if the appetite is bad you may add to it some bitter, such as quinine (F. 201), calumba, or strychnine (F. 211); but you never prescribe iron when there is nausea after food or a foul tongue, or when the urine is loaded with lithates.

In affections of the nervous system the nervine tonics are indicated; either phosphorus, valerianate of zinc (F. 233), strychnine (F. 102), or arsenic (F. 224) may be given. In some of these cases there is an inability to absorb fat in sufficient quantity, and you must then have recourse to cod-liver oil. This is often exceedingly useful where the patient is old and where there is a sensation of craving after food.

Amer.—The patient must not eat too frequently, or too much at a time. In bad cases the food may be peptonised or pancreatised. Beef,

mutton, game, are more easily digested than pork, veal, salted or preserved food, or raw vegetables. When the appetite is bad, quassia, gentian, or calumba may be given, also the Hydrastris canadensis, which may be prescribed in the form of a fluid extract, combined with glycerine and small doses of nux vomica. Where the digestion is slow, ipecacuanha may be given shortly before food (½ gr.), or hydrochloric acid one hour after food, or pepsin, with or without the acid. Where the nervous system is at fault, nux vomica or nitrate of silver may be prescribed. In colonic dyspepsia no saline purgative should be allowed, but rhubarb, aloes, senna, or podophyllin, if necessary. Where there is a colicky condition the exhibition of 2 or 3 minims, three times a day, of the tincture of coloeynth acts favorably.

Cancer of the Stomach.

Prognosis.—This is, under every circumstance, most unfavorable, the usual cause of death being exhaustion. The complaint terminates, as a rule, more quickly than malignant disease in other organs, on account of the early occurrence of ulceration and of the co-existing destruction of the secreting structures. Cases of colloid are usually of slower progress than the other forms of cancer.

Treatment.—As soon as you are satisfied that the case is one of cancer, all medicines likely to diminish the patient's strength must be abandoned. For example, you should forbid the use of mercury, iodine, and saline aperients, as being apt to increase the debility.

F. The diet should consist of substances of a nutritious and, at the same time, readily digestible character. Highly spiced food, as well as stimulants, must be avoided; but, when the weakness is extreme, you may allow wine or spirits. It is not necessary to restrict the patient to a milk diet, as in the case of simple ulcer of the stomach, for the pain is often less after solid than liquid food. If the pylorus is the seat of the mischief, and the stomach has, in consequence, become dilated, the diet must be regulated by the rules laid down for the treatment of that condition.

Where loss of appetite is an early symptom you may prescribe quinine (F. 215), nux vomica, (F. 211), calumba, or some other bitter. If anæmia be present you should have recourse to iron, the best forms being the saccharated carbonate and the

citrate. In case of constipation you may use aloes or an aperient enema.

The symptoms that usually require treatment are pain, flatulence, vomiting, and diarrhœa.

The pain is best relieved by the subcutaneous injection of morphine, with or without atropine, which may be repeated if necessary two or three times a day, but in some cases more alleviation is afforded by a mixture of chloral and bromide of potassium (F. 109).

Foul eructations require the use of charcoal (F. 32), or carbolic acid. Cajuput oil has been recommended, in doses of one to three drops on a piece of sugar, for the relief of flatulence.

Vomiting should be treated with iced milk and small doses of opium, and if this fails, the patient must be supported by nutritive enemata, and all food by the mouth should be withdrawn. If there be evidence of fermentation, carbolic acid (F. 34), creasote, sulphite of sodium (F. 33), or the sulphocarbolate of sodium may be given, or the stomach may be washed out every two or three days with warm water.

C. *Amer.*—Opium, or some other narcotic, is necessary to relieve pain. If acid eructations, bicarbonate of sodium, lime water, or calcined magnesia. In other cases creasote, salicylate of sodium, or carbolic acid. Charcoal is often of use.

Germ.—Condurango sometimes relieves, but does not cure cancer.

F. *Amer.*—It is not necessary to regulate the diet so strictly as in simple ulcer, but usually milk and beef-juice agree best. "Beef steak may be made from the soft mass scraped by a blunt instrument from a tender loin of beef, so that all coarse and tough fibres may be left behind. This may be superficially broiled with a little fresh butter." Boiled white fish, boiled sweetbread, boiled calf's brains and calf's feet may be tried. Boiled fowl, and dishes formed of milk, beaten eggs, and farinaceous substances may be used.

Fr.—Same as in ulcer of stomach.

Germ.—In cancer, relief may be obtained by the washing out of the stomach. In some cases resection of the diseased part has been practised.

Dilatation of the Stomach.

Prognosis.—This condition may occur as an acute or a chronic affection. The acute form is exceedingly rare, and generally

presents itself in persons enfeebled by previous illness. The employment of the stomach-pump to relieve the distended organ is the proper mode of treatment. Chronic dilatation arises in most cases from narrowing of the pyloric orifice, but it occasionally occurs, when the muscular coat has been a long time incapable, from mere feebleness, of expelling the contents of the stomach. Where the constriction is caused by cancer, the prospect is, of course, bad, as the original malady is sure to end fatally. When the thickening of the pylorus is of a fibroid character, the case is of longer duration, and the symptoms come on more gradually, but eventually the patient sinks from exhaustion. Some cases of recovery are recorded in which the narrowing seemed to have arisen from the contraction of the cicatrix of an ulcer, but, as a rule, these terminate fatally. If a tumour has produced the dilatation by compressing the pylorus or duodenum, the chief elements in the prognosis are the nature of the new growth and the amount of constriction it has produced.

Treatment (p. 27).—**A.** Excepting in dilatation from muscular atony, which is rare, and which must be regarded as a case of feeble digestion, we have no causal indications for treatment. In some cases it is possible to dilate mechanically the pylorus when the obstruction is of a cicatricial nature.

You would imagine that the vomiting which accompanies the disease would effectually prevent any accumulation, but it is more of the nature of regurgitation than of vomiting, and you can always, even directly after it has occurred, prove by percussion that the organ is still overloaded. This, no doubt, arises from the muscular fibres having been so stretched that they have lost their tone, and are unable to assist in the complete expulsion of the contents.

Nothing affords so much relief as the regular washing out of the stomach, since it removes the undigested and decomposing materials that remain in the organ, together with the mucus resulting from the irritation set up by their presence. It should be done at first each day, until the stomach is completely cleared, and afterwards, every two or three days, as occasion may require.

In every case of dilatation of the stomach you should restrict the patient to frequent and small quantities of food, so as to

permit of digestion going on with as little accumulation as possible. We have seen benefit from the application of a flannel or elastic bandage round the abdomen, so as to raise the organ, and thus lessen the labour of its muscular coat in propelling the food through the pylorus.

H. Tonics are seldom of much use, as they are digested with as much difficulty as the food, and also because the power of absorption by the stomach is much lessened by its distension. Galvanism might be expected to be of value, but it has seldom proved so, probably because the distension generally arises from a mechanical cause.

The results of dilatation of the stomach that require consideration are—1. Fermentation of the food. 2. Vomiting. 3. Emaciation. 4. Constipation.

The vomiting chiefly arises from fermentation, so that whatever lessens the latter reduces the former. Various drugs that check this process are usually prescribed. These are carbolic acid (F. 31), creasote, sulphurous acid, sulphite of sodium (F. 33), and naphthol. The carbolic acid is the most effective. When the acidity, as is often the case in the early stage, is the prominent symptom, you may relieve it by means of chalk, lime water, or alkaline carbonates (F. 18). The main point, however, is to prevent the formation of the acid by a careful selection of the food; thus you must prohibit starch and sugar, and restrict your patient to animal broths, milk and lime water, coffee, eggs, minced meat, and fish. In some cases cod-liver oil forms a useful adjunct. In cases of simple atony a purely milk diet answers best.

Constipation should not be treated by the ordinary aperients, as these are often very ineffective, on account of their not being properly digested or absorbed. It is a better plan to relieve the bowels by enemata, but you must remember there is seldom a necessity for a daily evacuation, as only a small quantity of food finds its way into the intestine.

Failure in nutrition, sooner or later, shows itself, and the patient sinks from exhaustion. When, therefore, it is obvious that the amount of food digested is insufficient, you must have recourse to nutritive enemata, which may be administered two or three times a day.

In some cases of stricture of the pylorus the abdomen has been opened, the stomach incised, and the pylorus stretched by the introduction of the finger. Such an operation is only likely to succeed when the stricture has been produced by the cicatrisation of an ulcer, and even then it should not be attempted unless all other means have proved fruitless to relieve the patient. In addition to the danger inseparable from the opening of the abdominal cavity, the stretching of the stricture may cause death, and we have known the duodenum ruptured by the operator in his endeavour to dilate the narrowed part.

The invariably fatal issue of cancer of the pylorus has induced some surgeons to attempt the removal of the disease by operation. The amount of success has not been great, for the disease has in most instances recurred; and there are but few cases where, from the absence of adhesions, of enlarged glands, and of the implication of the neighbouring organs, the whole of the diseased structures can be removed.

F. *Amer.*—The stomach-tube should be used from time to time. As little fluid as possible to be taken with food. A pure milk diet seldom agrees, but it, as well as Leube's beef solution, may be given. Raw beef steak, soft boiled eggs, and fowl, form the best articles of diet, but fatty, saccharine, and amylaceous kinds of food usually disagree.

Germ.—Empty the stomach by the syringe or siphon. If there is evidence of decomposition in the contents of the stomach, the organ may be washed out with a solution of salicylic acid (1 per cent.), or of resorcin (2 per cent.). Galvanisation may be practised. The action of the bowels is best assisted by Carlsbad salts.

CHAPTER IX.

DISEASES OF THE INTESTINES.

When a person is at rest, or asleep, the action of the intestines is very slight, whilst exertion stimulates their contractions. Whenever, therefore, there is a tendency to diarrhœa, you must order rest, whilst in cases of constipation the patient should take regular and active exercise.

The nature of the food influences the intestinal movements. Liquids, being, to a great extent, absorbed before they reach the colon, are to be preferred when it is necessary to give rest to the canal, as in cases of typhoid or tubercular ulcerations. Milk and farinaceous food are more constipating than beef-tea, or other animal broths.

The greater the amount of material insoluble in the gastric and intestinal secretions that is contained in any article of food, the larger is the quantity of fæces produced, and the more stimulating, therefore, it is to the bowels. Thus farinaceous and most kinds of animal food are constipating, whilst fruit and vegetables, being less soluble in the stomach, tend to excite the muscular coat of the intestines. Brown bread, oatmeal, green vegetables, and cooked fruit, on account of their insolubility, increase the activity of the bowels, and are, therefore, of especial value in the treatment of chronic constipation.

The Pharmacopœia abounds with drugs which stimulate the contractions of the intestines, and which, in most cases, also increase the secretion of the mucous membrane or of the glands opening into it. They are usually divided into laxatives, and simple, drastic, and hydragogue purgatives.

The laxatives include castor oil, magnesia, and sulphur. They are preferred where it is desirable to procure a free evacua-

tion of the bowels without greatly stimulating the muscular coat. Castor oil is the aperient usually prescribed when you wish to operate upon the bowels with the least possible irritation.

Simple purgatives comprise various salts of sodium and magnesium, especially the sulphates and tartrates, also rhubarb, senna, aloes, and cascara sagrada. The salines are best adapted for cases of hepatic congestion, as they remove, without much irritation, a considerable amount of serous fluid from the circulation. For the same reason they are employed in the treatment of the cases of contracted kidneys that occur in gouty people, accompanied by high arterial tension; but they are not fitted for anæmic persons, on account of their tendency to drain away the liquid part of the blood. It is unwise to persist in their use for a lengthened period, since they are apt to produce an atonic condition of the digestive canal, and the bowels become thereby so enfeebled that the strength of the doses must be gradually increased. Rhubarb is not often used by itself as a purgative, as it tends to leave constipation after its aperient effect has passed away; it is generally combined with aloes or colocynth. Senna is also usually given in combination with other aperients. Aloes seems to act chiefly on the lower part of the large intestine, and is well adapted for cases of chronic constipation, where a long course of aperients is required.

Drastic purgatives, such as jalap, scammony, colocynth, and croton oil, act more severely than those contained in the class last mentioned. They are preferred when it is desirable to operate quickly and fully. The first three are generally added to other purgatives to assist in their action, but, from their tendency to produce griping, they are rarely used alone. Croton oil is invaluable in affections of the brain, where you require a powerful derivative action; where there is difficulty in swallowing, half a minim or one minim may be placed on the tongue of the patient.

The hydragogue purgatives include gamboge, elaterium, and the acid tartrate of potassium; they are chiefly prescribed when it is necessary to remove dropsical effusions. The compound powder of jalap is that most generally employed; gamboge is

very effective when combined with the acid tartrate of potassium or the compound jalap powder; elaterium may be given in doses of one sixteenth to one half a grain, every three hours until it operates.

Enemata act on the bowels without irritation, and may be employed when purgative medicines are inadmissible. A sufficiency of fluid should be injected, varying from one to three, or even four pints; it ought to be used warm, and may consist of water, soap-and-water, thin gruel, or barley water. Castor oil or turpentine added to the injection increases its efficiency. As these float upon the top of the water, and are apt to be left in the basin, it is a good plan to inject them first, beaten up with half a pint of water, and afterwards to throw up the remainder of the fluid. When an enema is to be administered, the patient should lie on his left side, and the fluid should be very slowly injected. As soon as a feeling of griping comes on, the injecting may be suspended, to be resumed when the desire to evacuate the bowels has passed away. The patient should be encouraged to retain the fluid for about ten minutes, in order that the whole of the large intestine may be stimulated to action.

Enemata are generally administered by means of a pump or india-rubber ball, but when it is necessary to wash out the large intestine more thoroughly, an elastic tube provided with a funnel may be used. The patient must lie on his left side, with the head low and the hips raised; the tube is then carefully passed up as far as possible, and the injection slowly introduced through the funnel. When pain is experienced, the further influx of the fluid should be stopped for a few minutes, but the injection may be afterwards continued until a sufficient quantity has been introduced. In slight cases of constipation a drachm of glycerine, injected into the rectum, is often sufficient to relieve the bowels.

When an enema is used to arrest diarrhœa, a very small quantity of thin boiled starch should be employed. One or two ounces is sufficient, and tincture of opium is usually mixed with it. In chronic or severe cases you may add acetate of lead or sulphate of copper.

SECTION I.

Morbid States not necessarily dependent on Organic Disease.

The diseases of the intestinal canal are so common that you are daily called upon to treat them. Many are comparatively trifling; some are very difficult, both in their diagnosis and treatment. In all chronic disorders the condition of the intestinal canal is of great importance, on account of its function of absorbing the nutriment from the system. Any undue action of the muscular coat hurries forward the contents before they can be taken into the circulation, whilst an imperfect contraction produces, by sympathy, a sluggish motion of the stomach and duodenum. The activity of the intestines may be increased, producing diarrhœa, or it may be lessened, giving rise to constipation.

Diarrhœa.

By diarrhœa we understand frequent and copious evacuations from the bowels, with or without griping, but without tenesmus. For the purpose of prognosis and treatment we must distinguish between the acute and chronic forms of the disease.

Prognosis.—Acute diarrhœa usually arises—1. From nervous irritation. 2. From fermentation, excited by undigested food. 3. From an abnormal state of the secretions of the digestive canal, or of some of the glands opening into it. 4. From catarrh of the mucous surface produced by other causes. It commonly subsides as soon as the cause which has excited it has been removed, but it may prove dangerous in young or in very old persons, or in those who have been weakened by other diseases.

The prognosis is more grave in chronic than in acute diarrhœa. It accompanies ulceration of the intestines, whether this arises from catarrh or from tubercular or cancerous growths; it is a symptom of typhoid fever, and of lardaceous and other constitu-

tional diseases. In all these the prospect of recovery depends rather on the malady with which the diarrhœa is associated than on the symptom itself. The frequent evacuation of the bowels, however, tends to enfeeble the patient, partly by the drain of fluid from the vascular system, and partly by hurrying the food through the canal before absorption is effected.

Treatment of Acute Diarrhœa.

In every case, both of acute and of chronic diarrhœa, you must first satisfy yourself that it is wise to check the excessive action of the bowels. In some cases—as, for instance, where there is increased pressure in the portal veins from atrophy of the liver, or when the system is loaded with urea consequent on atrophy of the kidneys—a certain amount of diarrhœa is an advantage to the patient, and you should not interfere unless you find that his strength is greatly diminished by the drain upon the circulation.

Diarrhœa from nervous irritation is more often met with in private than in hospital practice. The patient is liable to purging, coming on suddenly and attended with little or no griping. The stools are feculent, not of an acid character, and unmixed with mucus. Although an attack usually subsides quickly, it is annoying from the frequency and irregularity of its occurrence. Females, or young persons of either sex, are chiefly liable to it, or it may occur at any age in individuals of a nervous temperament, or in such as are weakened by some chronic malady. The purging may be excited by very trivial circumstances, such as mental agitation, over-fatigue, or slight changes in diet. A small dose of opium (a quarter or half a grain) or of chlorodyne or of morphine and hydrocyanic acid will generally ward off a threatened attack.

Tonic treatment is required to overcome the tendency to this complaint. Where there is anæmia, a course of iron will be of service, the tincture of perchloride (F. 200) being the most useful preparation ; in others the phosphate, sulphate (F. 232), or valerianate of zinc will be more successful. Where anæmia is not present, you will generally find a course of dilute nitric acid (F. 209), with a few drops of the tincture of opium, and with or without cinchona, calumba, or nux vomica, of value. Dr. Ringer

recommends one or two drops of liquor arsenicalis, given shortly before each meal, in the case of children where diarrhœa comes on suddenly after taking food, and where it is accompanied by sinking at the stomach, relieved by food. The bowels in many cases become constipated when tonics are given. This must be obviated by the mildest aperients, such as tincture of rhubarb, the compound powder of rhubarb, or a small dose of castor oil.

Diarrhœa most frequently arises from fermentation of the food. Under ordinary circumstances the gastric juice is neutralised, in its passage through the intestines, by the secretions poured into the canal; but where an excessive amount of acid is produced by fermentation it does not undergo this change, and therefore sets up irritation of the mucous membrane. The stools are frequent, have an acid reaction and sour smell, and are sometimes frothy when allowed to stand. There is almost always considerable griping, on account of the irregular muscular contractions.

The first point is to ascertain if the muscular contractions have sufficed to remove the source of irritation, for if such is not the case you must assist the effort of nature by an aperient. You ascertain the necessity for this by observing whether the stools are small in quantity, feculent, and mixed with solid or knotty lumps, if there is much fœtor, and if there are frequent and ineffectual efforts to empty the bowels. When any of these signs are present, you may give a dose of calomel, with or without opium, followed by castor oil, or you may prescribe castor oil and laudanum, or a draught of the tincture or compound powder of rhubarb (F. 140). In children, you prescribe calomel alone, as opium is not so well borne by them as by adults.

But where you have no evidence of the retention of decomposing materials, you should order medicines to neutralise the acid of the intestinal contents. Chalk answers best, and it is on account of this being the most common form of the complaint that the Mistura Cretæ is so generally regarded as a specific for diarrhœa. When the stools are watery and acid, and the complaint resists chalk or the alkalies, carbolic acid (F. 34) or creasote will be found valuable.

Bilious diarrhœa is much more rare than the preceding form

of the complaint. It occurs chiefly in the summer and autumn. The stools are dark, not acid, and often scald the anus in their passage. Chalk and alkalies are of no use; on the contrary, they tend to increase the mischief. Acids are the most effective remedies, and a few doses often at once relieve the purging. The dilute sulphuric acid (F. 47) is usually preferred, and may be given along with laudanum and chloroform.

Where either of the preceding varieties of diarrhœa has persisted for a day or two, the circulation of the mucous membrane is apt to become enfeebled, and a watery evacuation replaces that which before was acid or alkaline. Astringents are then required, of which you may use the dilute sulphuric acid, logwood (F. 47), kino, or catechu, with or without opium. Where the discharge is very watery, acetate of lead and opium (F. 60), or alum and opium, are to be preferred. At the same time some form of stimulant, such as brandy, will be found useful. In severe cases, where the strength of the patient seems likely to fail, you must employ an enema of starch and opium.

Slight catarrh of the mucous membrane is probably always present in the preceding forms of diarrhœa, but it disappears as soon as the irritation is removed. When diarrhœa arises from intestinal catarrh alone, it is distinguished by the pain of the abdomen being more continuous than in the preceding forms, and being accompanied by tenderness on pressure. The pulse is quickened, the temperature of the skin a little raised towards evening; the patient complains of thirst, loss of appetite, and debility; the tongue is red at the tip, and often rather dry; the stools are watery and mixed with mucus. The treatment must be directed, not against the purging, which is only a symptom, but in order to relieve the inflammation of the mucous membrane which produces it. You should therefore prescribe a warm or vapour bath, keep your patient in bed, and order some febrifuge medicine (F. 87), along with a moderate dose of the compound tincture of camphor, Tinctura Opii, or the compound ipecacuanha powder. Some practitioners prefer jaborandi, or a subcutaneous injection of pilocarpine, if the case is a severe one. If there is much pain in the abdomen, you may apply hot poultices or fomentations.

In all the above varieties of diarrhœa you must confine your patient, if the case is a severe one, to liquid food—milk, arrow-root, sago, or corn-flour being most suitable. Meat broths are apt to purge, unless mixed with farinaceous food. Fruit, vegetables, and wines, from their tendency to fermentation, generally increase the complaint.

Treatment of Chronic Diarrhœa.

This is usually very difficult, and often unsatisfactory. You will have to watch your case carefully, because attacks of subacute catarrh not unfrequently occur, and require an alteration in the treatment during their continuance.

When a case is submitted to you, first ascertain if there be any disease of the rectum. Cancer of this part gives rise to frequent passages of blood and mucus, which are not uncommonly looked upon by the patient as diarrhœa, when in reality there is constipation. If there be no stricture of the rectum or colon, ascertain the cause of the diarrhœa. It may arise from a disease of the liver or kidneys, from lardaceous disease, or catarrhal, tubercular, or cancerous ulceration of the intestine, or it may be the consequence of dysentery contracted in a tropical climate. It is generally unwise to check purging in cirrhosis of the liver and chronic disease of the kidneys, and the same may be said of the diarrhœa of gouty subjects. You must, therefore, determine in each case whether it is advisable to stop it, by reference to the condition and strength of the patient.

As a general rule, chronic diarrhœa requires the use of astringents. In the slighter and more recent cases vegetable remedies answer best, such as logwood (F. 59), tannic acid, or kino, or you may employ bismuth (F. 25). They are likewise most suitable for those in which there is a liability to attacks of acute or subacute catarrh. The carbonate of bismuth, combined with chalk and Dover's powder, is usually the most useful remedy, but it is often necessary to continue it for a considerable time. The oxide of zinc along with opium is also very valuable, as it acts as a general tonic, at the same time it checks the diarrhœa. In the more chronic cases, especially where you suspect ulceration, you may prescribe with more advantage

metallic salts, such as perchloride of iron (F. 200), sulphate of copper (F. 55), acetate of lead (F. 60), or nitrate of silver. In most cases you must employ opium to diminish the muscular irritability; it may be given either by the mouth, by enema, or in the form of a suppository. Whenever you observe evidences of decomposition in the evacuations you must give carbolic acid (F. 34), creasote, or naphthol, in addition to your other remedies. If the stools are pale, or you have reason to suspect congestion of the liver, you will find small doses of the perchloride of mercury most efficacious; and where the disease has been contracted in malarial climates, a course of arsenic in small doses is often successful when all other methods of treatment have failed.

You will find great advantage from the use of a bandage of flannel to the abdomen, and where there is much pain the repeated application of small blisters over the tender parts is invaluable.

The patient should keep as much as possible in the recumbent posture, and must avoid vegetables, fruits, and wines. In every case it is wise at first to restrict him entirely to milk, or to milk mixed with farinaceous food, as cases that are rebellious to all medicines often do well under such a treatment. Where milk diet fails, peptonised or pancreatised food may be tried, or solid food may be given in small quantities at a time.

Where you have reason to believe the diarrhœa arises from an affection of the large intestine, astringent enemata should be used. If scybala are detected in the evacuations, small doses of the tincture of rhubarb or of castor oil are indicated.

Chronic Constipation.

Treatment (p. 34).—The indications for the treatment of chronic constipation are the same as those for the relief of other muscular organs in a state of long-continued dilatation. Before, however, prescribing for such a case you should ascertain that there is no mechanical obstruction to the action of the bowels; thus it often arises from cancer of the rectum, gradually narrowing the passage; and in the female, retroversion, or a fibroid or other tumour of the uterus, is not unfrequently the cause of

a difficulty in obtaining a free evacuation. Herniæ sometimes produce it, by dragging down and displacing portions of the intestinal canal.

Next, ascertain, by careful percussion and palpation, if there is an accumulation of fæces in any part of the colon, and also observe if the abdominal muscles are very lax, or incapable of due contraction. In the latter case an elastic bandage is necessary. Remember that in the case of females the use of a pessary is a common cause of constipation.

A. The first point in the treatment is, of course, to remove the cause. The *normal stimuli* to the muscular coat of the colon are—1. The undigested remains of the food. 2. The biliary and other secretions. 3. Muscular exercise of the body generally.

Most of the cases of obstinate constipation result from an improper diet. The use of large quantities of animal food, white bread, and of alcoholic beverages, is apt to produce constipation, on account of the small amount of insoluble materials they contain. In many instances the substitution of brown or rye bread, or of oatmeal porridge, for white bread, is sufficient to relieve the troublesome symptoms under which the patients have so long laboured. In others green vegetables, treacle, stewed prunes, figs, apples, and other fruits are effective remedies. When the tendency to constipation is moderate, benefit will be derived from the patient eating a few well-stewed prunes followed by a tumblerful of hot or cold water, as soon as he awakes in the morning. Others find the water alone sufficient, and in the case of smokers, a tumblerful of water on awaking, with a cigar after breakfast, is often sufficient to produce a free evacuation of bowels. When there is much debility, you may order porter or bitter ale to be taken with the meals.

When, along with constipation, you find the tongue yellow, the complexion sallow, and the stools pale and fetid, you should attempt to remove it by increasing the flow of bile. You may accomplish this by the use of calomel or podophyllin (F. 162), leptandrin, taraxacum (F. 15), Pil. Hydrarg., and other remedies of the same kind. A piece of rhubarb, chewed in the mouth every morning, is useful in the same way.

Regular exercise in the open air is necessary to promote the

action of the bowels in all cases of constipation, and this is especially requisite for persons following sedentary pursuits, who should, as far as possible, employ their leisure time in horse exercise, rowing, bicycling, &c. Those who are confined to the desk should write standing, or use a high stool or chair.

H. Before beginning your treatment of constipation, you should first clear the bowels from all accumulations, so as to permit the muscular coat to contract as far as it is capable of doing. For such a purpose you may prescribe castor oil, or pills of calomel (F. 161), or Pil. Hydrarg. (F. 160), combined with the compound extract of colocynth or rhubarb pill; or you may give repeated doses of sulphate of magnesium or sulphate of sodium, along with carbonate of magnesium (F. 148). It is a mistake to leave off the aperients until they have completely cleared the bowels. You should continue their use as long as the evacuations are lumpy or knotty, and until they have regained their normal colour.

You must persist in the employment of some mild aperient after all accumulation has been removed, or the feebleness of the muscular coat will permit the intestine again to become distended. For this purpose ascertain which part of the bowel is most liable to dilate. If it be the cæcum or ascending colon, aperients that stimulate secretion, such as senna (F. 132), sulphur (F. 134), cascara, sulphate of sodium or magnesium, castor oil, or mineral waters, as those of Friedrichshall or Carlsbad, are the most efficacious. Remember, however, to combine a small dose of quinine, or some other tonic, with the salines, for a long continuance of this kind of purgative is very apt to give rise to general weakness, as well as to debility of the muscular coat of the intestinal canal. Not unfrequently, in very chronic cases, a teaspoonful of castor oil each night will relieve the constipation; and if this cannot be taken, a tablespoonful of olive oil at night, or a dessertspoonful of glycerine in the early morning, may be tried. It is in affections of the cæcum that cascara is more especially of use, and if the constipation is, as is not unfrequently the case, attended with difficulty in the digestion of fatty materials, it may be combined with the extract of malt (F. 143) or glycerine. When the descending colon or rectum is

in fault, you must employ aloes, and may combine it with extract of belladonna, nux vomica, or iron (F. 155).

It is of no use trusting to aperients alone to overcome chronic constipation. They should be combined with tonics, and the relative doses of each must be varied from time to time. Where there is anæmia you should add iron, and if the appetite is bad some bitter may be used. In other cases zinc is preferable, especially when there is feebleness of the nervous system. If the cæcum or ascending part of the colon be in fault nux vomica has a good effect; or, if there be any objection to its use, beberine or cinchona may be employed.

It is not a good plan to trust to the use of enemata for the relief of chronic constipation, as their constant employment produces feebleness of the muscular coat, so that the bowels will not act without artificial stimulation.

Where the cæcum is the chief seat of the obstruction, careful shampooing every morning is often of service, especially if the abdominal muscles are feeble. In other instances, the galvanic current stimulates the muscular coat and keeps up its nutrition. In all cases the patient should accustom the bowels to act at the same hour each day.

A. *Amer.*—For persons following sedentary occupations exercise is essential. The diet should consist of fresh vegetables, such as spinach, raw or stewed tomatoes, lettuce, kale, salsify, peas, asparagus, or kohl-rabi in summer; and in winter tinned vegetables. Amongst fruits, grapes, peaches, oranges, or figs, raisins, stewed prunes, and baked apples. Brown bread, Graham-flour bread, bran bread, or oatmeal well boiled. An orange on rising is a pleasant remedy. Massage and faradisation of the abdominal muscles is useful. Tonics, such as strychnia and quinine, are often effectual. In prescribing drugs, it is better to vary them than to persevere continuously with any; in this alternating treatment, the fluid extracts of rhamnus (buckthorn), and cascara sagrada, or alum, or sulphur in the form of confection, or sulphur with guaiacum (½ dr. of each at night).

Germ.—Let the patient use rye bread and fruit, such as prunes, grapes, &c. Friedrichshall water may be taken early in the morning. Massage and faradisation of the abdomen are useful.

Neuralgia of the Intestines.

Pains of a neuralgic character affecting the abdomen are very often met with. They most commonly result from the irritation produced by renal or biliary calculi, but in some instances they are caused by the pressure of an abdominal aneurism or a tumour of some other kind. Although idiopathic neuralgia occasionally presents itself, you should never be satisfied that a severe pain arises from this cause alone until you have made a most searching examination of all the organs contained in the abdominal cavity.

Colic.

Spasmodic affections of the colon are very frequent, and are often attended with considerable difficulty in diagnosis and treatment. The pain of colic seems, in most cases, to arise from spasmodic efforts of the muscular coat of the large intestine to expel some irritating material. This may be an accumulation of fæces or flatus, or some biliary or other secretion. The chief predisposing causes are—1. An undue excitability of the nervous system, which renders the patient liable to spasmodic attacks of different kinds. 2. The effects of lead, and perhaps of other mineral substances, in paralysing the muscular coat of the intestines. 3. There is a form of colic, purely neuralgic, which occurs in persons who have lived for a long time in hot climates and have suffered from malaria.

Prognosis.—Colic rarely terminates fatally, except the patient is very feeble and generally out of health. It must, however, be borne in mind that occasionally it is followed by peritonitis, and thus indirectly it may place the patient's life in jeopardy.

Treatment during an attack (p. 27).

A. In all cases ascertain that the patient is not suffering from strangulated hernia. Your first aim must be to remove any exciting cause, such as a fæcal or flatulent accumulation. When you suspect the former, you may in slight cases prescribe a dose of castor oil and laudanum; or, if there be much vomiting,

calomel and opium, followed by an aperient draught (F. 148) four hours afterwards. If there should be any objection to aperients given by the mouth, a turpentine and castor oil enema may be used, and may be repeated if necessary until it acts freely. In gouty or other subjects, in whom you have reason to believe that flatulence is the exciting cause, you should use an enema, with or without turpentine, or assafœtida, and, at the same time, prescribe magnesia, along with ether, chloroform, or peppermint (F. 23). In a case of purely neuralgic character, where the patient has suffered from malaria, quinine in large doses will be of more service than aperients.

C. Your main hope of affording relief must be in the exhibition of sedatives. An aperient often fails to act unless it is mixed with opium. As a general rule, the subcutaneous injection of morphine, or of atropine, is the quickest way of removing the pain. In other cases, a draught containing morphine or tincture of belladonna, along with ether or chloroform (F. 174), will be found sufficient, and should be frequently repeated until the pain is relieved. In very severe cases it may be requisite to administer chloroform or ether by inhalation, but the spasm not unfrequently returns as soon as the patient's consciousness is restored.

Whenever it is practicable, you should employ a hot bath or hot hip bath, followed by fomentations or poultices, and an anodyne, such as opium or belladonna, may be added to the water used in the fomentation. Dr. Graves recommended in severe cases a solution of tobacco as a fomentation, but this is rarely required.

D. There is almost always great restlessness, so that it is difficult to keep the patient quiet. This should, however, be insisted upon, and he should remain upon the back, with the knees well supported.

Prevention of colic (p. 36).

A. You should attempt to ascertain, in each case, the exciting cause of the attacks. In some they follow the use of indigestible articles of food, such as cucumber, salad, or mushrooms; in others they seem to arise from exposure to wet or cold; more

rarely from bodily fatigue or extreme mental exertion. Where the absorption of lead has given rise to the complaint, you should impress upon the patient the necessity of always washing his hands before eating, and in bad cases he ought to give up his employment. The state of the bowels must be carefully watched, and a free action maintained until the evacuations acquire a healthy appearance. The rules for the treatment of chronic constipation should be followed, for in most cases an insufficient action of the intestines is the immediate cause of the attack. When the patient has suffered from malaria, you must keep him for a length of time on quinine or arsenic, or on both combined. In gouty persons, a course of colchicum along with liquor potassæ forms the best treatment: where the patient is of an hysterical character, sedatives and antispasmodics, such as bromide of potassium and valerian (F. 107), are of value.

F. All articles of food likely to produce constipation or dyspepsia should be prohibited. Persons of a gouty habit ought to abstain, as much as possible, from fermented liquors, especially from ale and porter, and the chief meal should be taken in the middle of the day.

Circumstances tending to enfeeble the digestive process must be avoided. Thus inquiry should be made as to the existence of excessive menstrual discharge, leucorrhœa, or prolonged suckling in females; and in males, as to the occurrence of bleeding from piles. The patient must be cautioned against excessive bodily or mental exertion.

Persons of a gouty habit should employ the Turkish or warm bath habitually, and carefully attend to their clothing. In all cases, advantage will be derived from the use of a flannel bandage to the abdomen, so as to maintain the skin of this part of the body at a uniform temperature.

H. There are few cases in which you are not required to lessen the undue excitability of the nervous system by the use of tonics. If anæmia is present iron must be prescribed, with or without bitters, according to the state of the appetite. When there seems no deficiency of blood, preparations of zinc may be used, such as the sulphate, phosphate, or valerianate (F. 233). Arsenic (F. 225) is most useful where chronic intestinal catarrh is also present. If the appetite is defective you may trust to cinchona,

chiretta, calumba, gentian, or some other bitter. Exercise in the open air is necessary, and the use of cold sea bathing or of shower-baths will tend still further to invigorate the nervous system.

Hæmorrhage from the Intestines.

This is not an unfrequent accident, and when profuse it is attended with great danger to life. This is in a great measure due to the fact that the bleeding often continues for some time before it is discovered.

Treatment (p. 24).—**A.** You will sometimes find considerable difficulty in determining the source of the hæmorrhage. The slighter cases are often the consequence of cirrhosis of the liver, or of hepatic congestion produced by enlargement of the right side of the heart. It must be remembered that a pitchy appearance of the stools, indicating hæmorrhage, but unaccompanied by vomiting of blood, occasionally occurs in gastric ulcer. It is still more common in ulcer of the duodenum, and when you have reason to suspect this lesion your prognosis must be cautious, because perforation of the peritoneum is more apt to take place in ulcers of this than of any other part of the gastro-intestinal tract. Where the blood appears unmixed with or only forming a coating of the stools, you may surmise that it has proceeded from the rectum or sigmoid flexure. You must, therefore, most carefully examine these parts with the finger and the speculum for piles, stricture, and cancerous growths. Hæmorrhage is apt to occur in typhoid fever, and more rarely in tubercular diseases, the ulcerations being generally situated at the lower end of the small intestines.

B. In the slighter cases resulting from congestion or atrophy of the liver, it may not be advisable to check the loss of blood. Under such circumstances the practitioner may administer a dose of calomel followed by some saline aperient (F. 49); he should confine the patient to bed, and restrict him to liquid food. Alcoholic stimulants must be withdrawn unless the circulation should appear to be unduly depressed.

In severe cases you may apply bladders of ice or ice-cold compresses to the abdomen, or may inject cold water into the

rectum. These measures must be employed with caution where the temperature has been much lowered or the heart depressed, as often occurs in typhoid fever. They are best fitted for hæmorrhage from ulcer of the stomach or duodenum. You employ astringent medicine, such as gallic acid (F. 45), mineral acids (F. 48), infusion of roses, acetate of lead (F. 60), or alum. In most cases the subcutaneous injection of ergotine is of service. When the bleeding appears to have come from the rectum, the tincture of hamamelis (F. 57) may be prescribed, or an enema containing hazeline, or the perchloride of iron may be given. Where there is much depression you must have recourse to stimulants, such as brandy, ammonia, or ether, administered either by the mouth or rectum. If this is not advisable, you may inject brandy (half a drachm) subcutaneously. In extreme cases transfusion of blood may be necessary. Many practitioners employ turpentine (F. 63), which acts as a stimulant to the heart, and at the same time tends to check the hæmorrhage.

D. Whenever you have reason to suspect that the bleeding has come from the intestines, or when it is to any dangerous amount, you must insist upon perfect rest in bed. You should prescribe a liquid diet, such as milk, beef tea, or farinaceous food, all of which should be taken cold. It is generally advisable to give opium, to check the action of the muscular coat of the intestines, but the doses must not be sufficient to depress the heart's power.

SECTION II.

Acute Diseases of the Intestines.

Catarrh of the Intestines.

Prognosis.—This occurs both in an acute and a chronic form, the latter being often a consequence of the former. When acute, the termination is usually favorable in adults, excepting in old persons. It is exceedingly dangerous in young children, and usually occurs during the period of dentition or weaning.

Chronic catarrh more frequently affects the large than the small intestine. When accompanied by ulceration, it may cause death, either by perforation of the peritoneum or by exhaustion. Both the acute and the chronic form are apt to accompany diseases of the heart, liver, and kidneys, and, under such circumstances, they prove dangerous to life by depressing the patient's strength.

Treatment of Acute Intestinal Catarrh (p. 16).

A. The first question is whether the free evacuation of the bowels, which accompanies the disease, has sufficed to carry away all undigested or irritating food that may have produced the attack. If the stools are mixed with knots or lumps, or are very offensive and feculent, it is probable that the cause remains, and you must remove it by means of aperients. For this purpose you may prescribe the tincture or compound powder of rhubarb, or castor oil, with or without the addition of tincture of opium, according to the amount of pain. In children, one or two grains of calomel forms the best aperient; and in adults, if there be much irritability of the stomach, you may give three grains of calomel and one grain of opium, followed by an enema or a dose of castor oil. Where you can trace the attack to cold, a warm bath, or a warm foot-bath, is generally useful in restoring the circulation.

If you have reason to suppose—and this is especially the case with children—that the attack is the result of fermentation of the food, it will be necessary for you to prescribe carbolic acid or creasote to check decomposition, whilst you insist on the perfect cleanliness of all the vessels in which the food is contained. In adults, the use of alcohol is occasionally the cause of repeated attacks of intestinal catarrh, and abstinence from all alcoholic liquids is then an absolute necessity.

B. If the attack is attended by collapse you may prescribe brandy, ammonia, or ether (F. 72). Small quantities of brandy are generally of use to relieve griping. In severe cases you should order the patient to be wrapped up in blankets, with hot bottles to his feet, to stimulate the circulation.

As soon as the stools become watery and the griping lessens,

if there be no tenderness on pressure, you should have recourse to astringents, so as to check the escape of fluid from the relaxed membrane. For this purpose you may employ acetate of lead, logwood, or tannic acid, with or without opium. Where the disease has lasted for some days, and recurrence of the diarrhœa takes place, bismuth (F. 25) is the most effective remedy. It may be given in an effervescent form, in combination with dilute hydrocyanic acid if there is much nausea, or with small doses of Dover's powder or tincture of opium if pain is a prominent symptom.

Whenever there is any tenderness on pressure, a large hot bran or linseed-meal poultice should be kept constantly applied to the abdomen, or hot fomentations or mustard poultices may be employed. Some have recommended, where there is much depression, that the abdomen should be covered with flannel wet with some form of alcohol, evaporation being prevented by a piece of gutta-percha cloth. Where poultices cannot be borne, you may apply a bandage of flannel.

D. In severe cases the patient must be confined to bed; in slighter attacks it will be necessary to guard against exposure to wet and cold. You should always insist upon physiological rest, by restricting him to small and frequent meals of liquid food, such as milk, arrowroot, corn-flour, &c. Beef tea had better be avoided, on account of its tendency to act upon the bowels. In many cases, milk mixed with lime water or soda water, or diluted with rice water or barley water, agrees better than pure milk, or it may be given in a peptonised or pancreatised form. In the case of children, whey or preserved milk can often be digested where pure milk cannot be borne. When there is much nausea the food should be given cold or iced, and in very small quantities at a time.

In very severe cases it may be necessary that the patient should abstain for a day or two from all food, thirst being relieved by the sucking of small pieces of ice. You should also afford rest to the muscular coat by means of opium. When the stomach is irritable, the subcutaneous injection of morphine may be employed; in other cases the compound powder of ipecacuanha, or the tincture of opium, is more useful. If there be much straining an opiate enema should be used.

A. *Amer.*—If caused by cold, give jaborandi or pilocarpine, followed by aconite and febrifuge medicines. If from malaria, prescribe quinine. If from retained fæces, a dose of calomel followed by castor oil. In Bright's disease do not stop the diarrhœa. Do not use purgatives in typhlitis.

Fr.—If from a chill, give Dover's powder. If from imperfect digestion, an emetic, followed by a saline aperient. In gouty cases sinapisms to the joints are useful.

Germ.—If from fæcal accumulation, give calomel, followed by castor oil.

B. *Amer.*—Apply hot poultices or flax-seed poultices to the abdomen. If the diarrhœa is attended with pain, prescribe bismuth and opium, or acetate of lead and opium. When there is diarrhœa without much pain, bismuth, oxide of zinc, or lime water may be used ; if the stools are very bilious, acetate of lead is of most value. In some cases calomel ($\frac{1}{12}$ gr. to $\frac{1}{6}$ gr. in children, or $\frac{1}{4}$ gr. to $\frac{1}{2}$ gr. for adults) given frequently for two or three days, answers well. Coto bark (F. 308) or nitrate of silver is serviceable when the disease seems likely to become chronic.

Fr.—To relieve pain give opium, and if much diarrhœa, combine it with bismuth, or when the large intestine is the seat of the disease these may be given in the form of an enema. If the diarrhœa is obstinate, a blister to the abdomen is of value ; nitrate of silver is useless.

Germ.—If diarrhœa is severe give opium, which may be combined with astringents (F. 306).

Typhlitis.

Prognosis.—So long as the cæcum is the only part inflamed the prognosis is favorable. Fatal cases occur from ulcers perforating the peritoneum or producing suppuration in the neighbouring connective tissue. When recovery takes place, the tumour is often slow in disappearing, and, occasionally, chronic catarrh of the cæcum or colon remains. Ulceration of the appendix is attended with greater danger than that of the cæcum, as perforation readily occurs in this part. Catarrh of the appendix sometimes ends in recovery, without producing symptoms of sufficient severity to attract the attention of the patient. Perityphlitis is always dangerous to life on account of its tendency to end in suppuration. The pus may point externally, or may burst into the peritoneum, or into one of the neighbouring portions of intestine.

Treatment (p. 16).—**A.** As typhlitis is usually the result of a feculent accumulation, it might seem there must be a conflict between two of the chief principles in the treatment of inflammation, viz. that of removing the cause and that of leaving the inflamed part at rest. Where the tumour is very tender, and the adjoining parts of the abdomen are also sensitive to pressure, when the pulse is quick and the temperature much increased, you had better avoid purgatives, because, in all probability, peritonitis is present. But if the tumour is not tender, if the pulse is soft and quiet, and the temperature normal, you may try to remove the irritating accumulation by the use of aperients. These should, however, be of the mildest description, such as castor oil or enemata of water, all irritating drugs, such as aloes or colocynth, being avoided.

B. Where there is much tenderness, and the patient is young and healthy, you had better apply six or eight leeches to the tumour, and repeat them if necessary. Let the whole abdomen be enveloped in a large hot poultice, or covered by a piece of spongio-piline. If the pain is severe, these may be sprinkled over with a teaspoonful of laudanum, or with equal parts of tincture of opium and tincture of belladonna, or the glycerine of belladonna may be painted over the part (F. 196).

C. On account of the pain you must use opium. The compound ipecacuanha powder is a useful preparation, but you may also give tincture of opium or morphine. The doses should be repeated every four or six hours, according to the amount of suffering.

D. In all cases insist on perfect rest. Let the body be raised, and the knees bent and supported by pillows. Confine the patient to a liquid diet, such as beef tea, milk, and farinaceous food, in order that as little feculent material as possible may be formed.

G. Where the complaint threatens to become chronic, the frequent application of small blisters is of use; but if there is much thickening about the intestine, the iodine liniment will be found more efficacious. In case of suppuration of the connective tissue, hot poultices and fomentations must be applied, and an opening should be made as soon as the pus seems to approach towards the surface. At the same time you must support the patient's

strength with soup, broth, milk, wine, &c. You may also prescribe quinine (F. 215), acids (F. 211), or other tonics.

The accidents you are called upon to treat are perforation of the peritoneum, constipation after recovery, diarrhœa from catarrh affecting the cæcum or colon, and, occasionally, hæmorrhage.

Intestinal Obstruction.

The prognosis and treatment of these cases so entirely depend upon their diagnosis that it will be necessary to make a few remarks upon it.

The causes of obstruction of the bowels may be—

1. The strangulation of a portion of the gut by bands, &c. 2. Twisting of the intestine. 3. Intussusception. 4. Narrowing of the calibre of the bowel by external pressure, or embarrassment of its motion by adhesions. 5. Stricture of the walls of the gut. 6. Blocking up of the passage by fæces, gall-stones, or other solid bodies.

When you are called to a case of intestinal obstruction, you must first examine for hernia. See that there is no protrusion at any of the abdominal openings, and remember that a very small knuckle of intestine, when incarcerated, is capable of stopping the motion of the whole canal. Next see that it is not a case of peritonitis. This is the most common error, and it is in many cases difficult to avoid. Peritonitis from perforation closely resembles some cases of intestinal obstruction, in the suddenness of its onset, and in the vomiting and obstinate constipation that accompany it. In peritonitis, however, the pain is the prominent symptom from the first, there is general and intense tenderness and distension of the abdomen, and the pulse is small and rapid; when it arises from perforation, you have generally a previous history of gastric or intestinal ulceration to assist your diagnosis.

The most difficult case is when the peritoneal inflammation has arisen from ulceration of the appendix, for then there are often no previous symptoms of ill-health.

If you can satisfy yourself there is neither hernia nor perito-

nitis, you next examine the rectum in order to ascertain if there be any feculent accumulation or stricture in that part.

Where you have failed by these means to discover the cause, you must ascertain whether the small or the large intestine is the seat of the obstruction. This requires care, for it is always a matter of great difficulty. If the small intestine be the part affected, the pain is usually severe, the vomiting comes on early and is urgent, the urine is scanty, and the progress of the case rapid. When the large intestine is the seat of the mischief the pain is less severe, the vomiting not so urgent, the urine is in sufficient quantity, and the progress slow. In the former the umbilical and hypogastric regions are chiefly distended, and the lumbar regions are not very tympanitic on percussion; in the latter the chief distension is in the hypochondriac, lumbar, or epigastric regions according to the seat of the obstruction. When you have made up your mind as to the part of the intestinal canal that is affected, you must remember that the obstruction may arise either from an acute or a chronic condition. In the acute the symptoms occur without previous warning; in the chronic they are preceded by evidences of disordered digestion.

In the small intestine the causes of acute obstruction are, in the order of their *rarity*—1. The impaction of a gall-stone or other foreign body. 2. Twisting of the gut. 3. Intussusception. 4. Internal strangulation.

Gall-stones almost always present themselves, when of sufficient size to block up the intestine, in females of middle age, and there is a history of jaundice and pain of the right hypochondrium, or of febrile attacks attended with tenderness over the gall-bladder. Twisting of the small intestine is rare, and the symptoms are very acute; it usually occurs in young people, and comes on without any apparent cause. Intussusception of the small intestine is most common in children. The pain is of a griping character, attended by the passing of blood or mucus, and a careful examination will generally detect a tumour in the abdomen. Internal strangulation is the most probable cause, if you are able to eliminate the foregoing more rare conditions. It usually takes place in young persons, and often follows a sudden strain or violent exertion.

The causes of chronic obstruction in the small intestine are

—1. Intussusception. 2. Adhesion of the coils of intestine or the pressure of tumours.

Chronic intussusception is rare; it occurs chiefly in young adults. A tumour can be usually distinguished in the abdomen, which is moveable, and often becomes hard under the pressure of the finger. The diagnosis of contraction must be made from the history of the case—as, for example, from the previous occurrence of local or general peritonitis. Tumours can be generally distinguished by careful examination.

In the large intestine the acute conditions capable of causing obstruction are—1. Intussusception. 2. Twisting of the bowel.

Intussusception is seldom met with except in children; the symptoms come on suddenly, there is a bloody or mucous discharge from the bowels, and a tumour can be generally felt externally or by the rectum. Twisting of the large intestine usually occurs in old people; the symptoms are acute, and the colon and sigmoid flexure are the parts commonly affected.

The chronic conditions are almost always stricture, the impaction of fæces, or the pressure of a tumour. The history of a gradually increasing constipation, with the results of a careful examination, will usually direct you to a correct opinion. You must bear in mind that the obstruction may be caused by the pressure of a pelvic tumour that can only be discovered by a rectal or vaginal examination.

Prognosis.—No case of intestinal obstruction is devoid of imminent danger, for even a feculent accumulation may produce peritonitis, or give rise to perforating ulceration. On the other hand, no case is necessarily fatal, for, even in a malignant stricture, the stoppage may be the result of an occlusion of the bowel by some hard or indigestible substance capable of being removed by art or by the muscular contractions. The danger depends, not only upon the age and general health of the individual, but also on the nature of the impediment to the evacuation of the bowels.

The impaction of a gall-stone is always exceedingly dangerous. The concretion must be of considerable size to obstruct the intestine, whilst its hard and unyielding nature prevents its being readily forced onwards by muscular action, and it may cause perforation by its pressure on the intestinal coats.

Twisting, either of the large or small intestine, is a very fatal accident. Even when the colon is the seat of the mischief, the symptoms are severe and the progress rapid. Sometimes, however, the obstruction is relieved spontaneously, even when the condition of the patient is such as to lead us to expect only a fatal termination.

Intussusception is exceedingly dangerous, both on account of the age at which it usually occurs, and from the nature of the accident. When seen at an early period it is frequently capable of being relieved by treatment; in other cases sloughing takes place, and a portion of the bowel is passed by the rectum. The danger in internal strangulation varies according to conditions which we are unable clinically to distinguish—as, for example, with the position and tightness of the constricting band. In chronic cases of obstruction the chance of recovery depends upon the nature of the cause, as well as upon the degree to which the intestine is still capable of performing its functions. Cancerous stricture, for example, is more certainly fatal than the obstruction produced by adhesions of the peritoneum.

Treatment.—When you have ascertained that the obstruction arises from hernia, peritonitis, malposition, or the pressure of a tumour of the uterus, you must treat the patient accordingly. But where none of these conditions are present, you should ascertain if there is an impaction of fæces in the large intestine. If such is the case, you should attempt its removal by enemata of warm water, or of barley water, with or without the admixture of castor oil or turpentine. Where the accumulation seems to be hard and difficult of solution, enemata of linseed oil are useful. When the rectum is the seat of the obstruction, you may remove it by means of the shank of an iron spoon, or some such instrument. Never trust the enemata to a nurse, but in all dangerous cases take the trouble of administering them yourself. The patient should lie on his right side, or, where you suspect twisting of the intestine, he may rest upon his hands and knees, whilst the fluid is slowly and patiently injected by means of a pump, or a soft india-rubber tube provided with a funnel.

The treatment of intussusception is chiefly mechanical. Where there is ileo-cæcal invagination, the passage of a long bougie up to the site of the obstruction, and its firm pressure

against the part, will sometimes suffice to reduce it. Others recommend large injections of warm water, but these are rarely of much use. The employment of air, thrown up by a pair of bellows or a pump, has been more successful, and merits a fair trial. This should, however, be restricted to recent cases, for if the symptoms have lasted many days, or there are signs of peritonitis or of gangrene of the gut, any mechanical interference is attended with danger. The patient should be placed under chloroform or ether during the attempts at reduction.

In chronic cases the abdomen has been laid open and the intestine successfully disentangled, but such an operation is, of course, very dangerous, and before advising it you must remember the chance there is of spontaneous separation of the affected part.

In all cases of intestinal obstruction purgatives are at first employed, but as soon as it becomes evident that there is a mechanical cause, these must be abandoned. Whenever you have good reason to suspect that the obstruction is the result of a fæcal accumulation, you should order a dose of calomel followed by a saline aperient (F. 148). Where there is much irritability of the stomach, the addition of a few drops of the glycerine of carbolic acid to the saline is often of great advantage.

The older physicians were in the habit of prescribing large quantities of mercury, in the hope that it would force a passage by its weight, but this measure is generally abandoned. The practice now adopted is to keep the patient under the influence of narcotics, so that the muscular action of the intestines may be allayed. Opium is best suited for this purpose, and the greater the pain and the more violent the symptoms, the more necessary is its early and persistent employment. When there is constant vomiting, you may inject subcutaneously one quarter of a grain of morphine, repeating the dose, so as to keep the patient under its influence. The same remedy may be administered in the shape of pill or tincture. Where the pain is less severe, one quarter or half a grain of the extract of belladonna may be given every four hours, or one sixtieth of a grain of atropine may be used subcutaneously, and repeated until the physiological effects of the drug are produced. Sometimes an enema of the

infusion of tobacco succeeds in removing obstruction when all other treatment has failed; but it should be used with great caution, as it is apt to produce dangerous or even fatal collapse.

Whenever it becomes evident that an obstruction cannot be overcome by medicine, some surgical procedure is necessary in order to save the life of the patient. Although every operation of this kind is attended with danger, and ought therefore not to be undertaken until all other measures have been tried, you must remember that the earlier it is performed the more likely is it to be successful. As regards stricture of the large intestine, there can be no difference of opinion, that as soon as it is shown that the obstruction cannot be relieved by medicine, the colon should be opened in some part of its course. If properly performed, the danger from the operation is slight, whilst the relief is immediate.

With respect to obstruction of the small intestines, the difficulty of diagnosis is greater, and the opening of the peritoneum is so dangerous that the practitioner is often inclined to delay surgical interference until it is too late to be useful. Where there is reason to believe that the obstruction arises from internal strangulation, an impacted gall-stone, or intussusception of the small intestine, the sooner the abdomen is opened, and the cause sought for and removed, the better will be the prospect of recovery; but where it arises from general adhesions of the peritoneum it is better to open the affected loop of intestine and establish an artificial anus. It is evident, however, that no definite rule can be laid down beforehand, but that the practitioner must employ the method of operation that seems to him most likely to afford relief to the overloaded intestine.

Where an operation on the abdomen has been decided to be useless, some practitioners are in the habit of introducing a fine trocar into the intestines, so as to withdraw a portion of the gas, and thus relieve the patient from the suffering produced by the distension.

SECTION III.

Chronic Diseases of the Intestines.

Chronic Intestinal Catarrh.

Treatment (p. 24).—**A.** In children, improper feeding is one of the chief causes of the complaint, and the diet must be therefore carefully regulated. In some, meat and vegetables pass through the digestive canal unaltered, and it is necessary to restrict the patient entirely to milk and farinaceous food. In adults, constipation is a common cause, and this must be obviated according to the rules laid down for that condition. In obstinate cases, in which ulcerations seem to co-exist, it is necessary to restrict the patient to a diet of milk, farinaceous food, eggs, and animal broths.

F. In children, when the complaint has followed an attack of acute catarrh, or when the food is passing through the canal in an undigested state, pepsin and small doses of dilute hydrochloric acid are of great value. Where there is anæmia, without fever, you may have recourse to cod-liver oil, steel wine, or Parrish's chemical food. If the iron is not well borne, the lactophosphate of lime or the hypophosphite of sodium or calcium may be used. In adults, you employ iron where there is anæmia; but if the appetite is bad, you should prescribe cinchona (F. 218), beberine, quinine (F. 215), or some other bitter.

H. In the choice of aperients you must remember that even small doses of these drugs often gripe and act violently. Be, therefore, cautious about prescribing aloes, podophyllin, or colocynth, and seek to effect your object by castor oil, cascara, olive oil, or aperient enemata. The abdomen should be maintained at an equable temperature by means of a flannel bandage, and the whole body carefully defended from wet and cold.

F. *Amer.*—When the disease is attended with constipation, purgatives should be as much as possible avoided, and an enema of cold water, or one containing sulphate of zinc or alum (1 gr. in 4 oz.), should be used

each morning. When aperients are necessary, extract of belladonna may be given, or small doses of aloin. Ipecacuanha is generally useful, combined with aperients. If there is much anæmia iron should be prescribed, but strychnia is of more value in most cases. The liquor pancreaticus may be given two hours after food. When the disease is attended with diarrhœa, milk forms the most useful kind of food, and as little as possible of starch, fatty, or saccharine materials should be permitted. Bismuth with small doses of opium may be given, and if these fail, the mineral acids; iron may be prescribed if the patient is anæmic. Where there is a malarial history, arsenic or quinine should be ordered. In very chronic cases, nitrate of silver ($\frac{1}{6}$ gr. to $\frac{1}{4}$ gr.) may be prescribed, or cold water enemata containing sulphate of zinc or acetate of lead (1 gr. to 4 or 6 oz. of water) may be used. Irrigation of the large intestine with solutions of nitrate of silver ($2\frac{1}{2}$ to 5 grs. in 3 pints of water) may be practised in obstinate cases. "The effort should be made to secure immediate exit to the fluid."

Fr.—In the form that results from congestion of the liver, leeches to the anus are beneficial. In uræmic cases no attempt should be made to arrest the diarrhœa. In malarial cases give quinine. In all, the food should consist chiefly of animal substances. When the disease is associated with constipation and distension, a certain amount of vegetables may be allowed, but farinaceous substances avoided. Aperient saline waters are of value. To relieve the distension, charcoal or turpentine may be employed. In the form connected with the uric acid diathesis, milk diet is to be recommended and alkaline waters prescribed. When associated with diarrhœa, bismuth and opium are the most useful drugs. If the evacuations are fœtid, charcoal may be added. If there is any objection to the remedies being taken by the mouth, an enema containing bismuth and opium may be used. In very chronic cases, tannin or the extract of rhatany should be prescribed, and in obstinate cases an enema of the nitrate of silver. Blisters to the abdomen are of great value.

SECTION IV.

Animal Parasites.

The treatment of intestinal worms includes their expulsion and the prevention of their recurrence. Before, however, prescribing any of the irritating drugs generally employed as anthelmintics,

you must satisfy yourself that your patient is really suffering from worms. Particles of food, pieces of muscular fibre, of connective tissue, and of vegetable matters that have escaped digestion, are often wrongly regarded as evidences of the presence of parasites.

In the treatment, you must not only select such drugs as are likely to destroy the worms, you must also take care that the portion of intestine they inhabit is at the same time empty, so that the medicines may come into contact with them.

Cestoda or Tapeworms.

Prognosis.— Although capable of affording great annoyance, and of affecting the general health by causing irritation of the intestines, these never produce death. There is often great difficulty in expelling the parasite, only a part of it coming away. Where this is the case, it will be necessary for you to vary your drugs, for sometimes one will prove effectual after others have failed. Where due care is taken, you will seldom, if ever, meet with a case that is incapable of cure.

Treatment.—Let the patient fast, or take only liquid food, for twelve hours before commencing the treatment. Generally, you first prescribe a dose of calomel and extract of colocynth (F. 161), castor oil, or some other aperient, so as to empty the intestinal canal. Early on the following morning the vermifuge may be given, and, unless there is excessive purging, it should be followed four hours afterwards by another aperient dose, such as castor oil, or the compound senna mixture.

The liquid extract of male fern (F. 30) is generally used. It may be given in doses, varying from fifteen to sixty minims, according to the age of the patient, and may be suspended in milk, or mucilage and cinnamon water. If necessary, the dose may be repeated a week afterwards.

Cusso (F. 27) is usually given as an infusion, the powder being swallowed along with the liquid. Heller recommends it in a compressed form, enclosed in a gelatine capsule.

The bark of the pomegranate root is a favourite remedy with some practitioners. It is given as a decoction, but it is unpleasant to the taste, and often produces violent griping.

The kamala is employed by some in doses of sixty to one hundred and twenty grains, suspended in gruel, mucilage, or treacle. It should be followed by a purgative.

The oil of turpentine was formerly employed, in doses of one to four drachms, but it is less efficacious than the medicines before mentioned.

The evacuations should be carefully searched after each dose of any of these drugs, to ascertain if the head of the worm has been expelled. Unless this is found you cannot be sure that the patient is cured. The evacuations are to be mixed with water and put aside for ten minutes, so as to allow the parasite to settle to the bottom. The water is then poured off and fresh added, until every fragment is inspected. The head is very small, and the finest joints are situated nearest to it. Where you are unable to find the head, if no joints are again passed within two months, it is probable the patient is cured. To prevent a recurrence, the patient should be careful to avoid meat that has been only smoked, or that is imperfectly cooked.

Nematoda or Round-worms.

The *Ascaris lumbricoides* is most commonly found in children, and is destroyed more readily than the tapeworm. Various dyspeptic and nervous symptoms are commonly ascribed to the irritation produced by it when it is present in the intestinal canal.

Treatment.—Santonine (F. 29) is the most useful drug for destroying the round-worm. You may prescribe an aperient of jalap, or jalap and scammony, the day previously, but in most cases this is unnecessary. The santonine may be taken at bed-time or early in the morning, in doses varying from two to six grains, according to the age of the patient, and should be followed by an aperient. Three doses are usually sufficient. Küchenmeister recommends that two to four grains of santonine be dissolved in one ounce of castor oil, and one teaspoonful should be taken every four hours, until it acts briskly on the bowels.

Turpentine was formerly employed in doses varying from one

to four drachms. It was administered along with castor oil, but it is less efficacious and more nauseous than the santonine.

There is still great doubt as to the manner in which the ova of this worm find an entrance into the digestive canal; but the precautions most likely to be useful, in order to prevent its recurrence, are the use of filtered water, of vegetables and fruit, thoroughly cooked, and attention to the general health. In many cases, a course of steel and cod-liver oil seems more efficacious than the vermifuge medicines so generally employed.

Oxyuris vermicularis—Threadworm.

This parasite is most often met with in children, but is not confined to them. In the case of adults there is often difficulty in overcoming the complaint, the worms making their appearance as soon as the person liable to them gets out of health.

Treatment.—As these worms generally inhabit the large intestine, it is the custom to attempt their expulsion by means of enemata. These may be used daily, and may contain common salt (one teaspoonful to one pint of water), lime water, perchloride of iron (one drachm to half a pint of water), quassia, or some other bitter infusion. Others have given an enema containing santonine with good effect. As, however, the worms are not confined to the large intestine, you will find it necessary, in obstinate cases, to give medicines by the mouth in order to eradicate them. Iron, quinine, strychnia, cod-liver oil, and other tonics are in most cases invaluable. At other times a course of tonic and aperient medicines, such as sulphate of iron and sulphate of magnesia, will be found to answer. Where they have been associated with obstinate constipation, an electuary of guaiacum and sulphur often succeeds. To destroy the ova of the worm, an ointment of mercury, such as the Unguentum Hydrargyri Ammoniati, may be smeared round the anus night and morning.

CHAPTER X.

DISEASES OF THE PERITONEUM.

SECTION I.

Acute Diseases of the Peritoneum.

Acute Peritonitis.

The diagnosis of peritonitis is often more difficult than you would imagine, for the symptoms may be but slightly marked. It seldom occurs idiopathically, but is usually the result of disease of one of the abdominal organs, of perforation of the stomach, intestines, or appendix vermiformis ; in the case of the female, of inflammation of the uterus, ovaries, or Fallopian tubes ; or it may arise from some general disorder, as pyæmia or diseased kidneys.

Prognosis.—Acute general peritonitis is always attended with imminent danger to life. Where it arises from perforation of the stomach, the case is almost hopeless, although a few instances of recovery are on record. Death may occur in twelve hours, and life is rarely prolonged beyond two or three days. It must be remembered that colic and other abdominal disorders are sometimes accompanied by collapse, so that you must not diagnose a case presenting sudden and severe pain of the abdomen, along with great depression, as necessarily the result of perforation. Peritonitis arising from kidney disease or pyæmia is usually, though not always, fatal. Puerperal peritonitis, although very dangerous, is more hopeful than the other forms of the complaint above mentioned. The prognosis of *local peritonitis*

is chiefly determined by its extent, and the nature of the disease which has given rise to it.

Treatment (p. 16).—**A.** It has been proposed, where perforation of the stomach has occurred shortly after a full meal, that the organ should be emptied of its contents by means of the stomach-pump, so as to prevent any further escape of food into the peritoneum. Unfortunately, patients who have suffered from this accident are usually in a state of collapse, so that such an operation is out of the question.

B. Most authors agree in recommending venesection, where it can be borne, and when the patient is seen at an early stage. The chief indication is the state of the arterial system, a small, wiry pulse being regarded as especially requiring it, and it is said that, as the blood flows, it becomes fuller and softer. It is, however, comparatively rare to meet this condition, most of the cases of general peritonitis being asthenic from the first, and the pulse being small, feeble, and compressible. Where general bloodletting can be safely practised, it is usually necessary to follow it by the application of a number of leeches to the abdomen, or, if the advisability of venesection is doubtful, the leeches may be used alone. In all cases, hot fomentations or poultices should be employed. Sometimes the weight of a poultice increases the suffering, and you may then substitute hot, wet flannels covered with oil-silk. Some practitioners prefer the use of ice-cold cloths or ice-bags to the abdomen; they will be found most useful when the temperature is high. In *partial peritonitis*, unless the state of the pulse forbid it, you will almost always give relief by leeches followed by poultices or hot fomentations.

In the early stage of asthenic peritonitis, such as occurs from perforation or puerperal affections, stimulants are required to overcome the collapse. In cases arising from perforation you must avoid giving any remedies by the mouth, lest they should find their way into the peritoneum. It is better to administer them subcutaneously, or by an enema. In local peritonitis stimulants are rarely necessary, unless failure of the heart should manifest itself.

D. In all cases the most perfect rest must be maintained. The patient should be placed in the recumbent position, with the

legs slightly raised and the bedclothes supported; even the exertion of talking must be avoided. If it is necessary to change his posture, he must not be allowed to give any assistance, and the most absolute quiet of the abdominal muscles should be enforced. Be careful to inquire if the patient is able to pass his urine, and, if you have any suspicion that the bladder is not thoroughly emptied, the catheter must be used. In very severe cases no food should be allowed, but a few pieces of ice may be sucked from time to time to alleviate thirst. In those that are less acute the diet should be restricted to small quantities of milk, barley water, or farinaceous food. No purgatives should be given, and only after the active symptoms have entirely subsided you may have recourse to an enema of warm water.

In order still more to restrain the action of the stomach and intestines, as well as to relieve pain, opium ought to be given freely. For an adult you may order one or two grains for the first dose, and repeat one grain, or half a grain, every three or four hours. In cases of perforation morphine may be used subcutaneously, and must be regularly repeated, so as to keep the patient under its influence; but when the kidneys are diseased, opium ought to be used with great caution. In partial peritonitis, opium, along with rest in the recumbent position, forms the main treatment, although the amount and frequency of the doses should be lessened.

G. As a general rule, the exudation is absorbed as soon as the inflammation subsides. Where this does not occur, in the case of children, a course of iodide of iron and cod-liver oil, along with a carefully regulated diet, is generally sufficient to remove the fluid; but in adults the process may be more tedious and difficult. You may, in the first instance, try the effect of diuretics, such as digitalis (F. 91) or the acetate, or acid tartrate of potassium (F. 90). If these fail, you may have recourse to perchloride of mercury (F. 4) or iodide of potassium (F. 8). In local peritonitis it will be often necessary to employ blisters or the external application of iodine, to promote the absorption of the effused products.

In all cases watch the abdomen daily, and if any signs of an abscess can be observed, an early opening is necessary.

Acute peritonitis, in young persons, is so often the result of

perforation of the appendix, that you should be always on your guard respecting it. The patient is usually a male between the ages of fifteen and thirty, the pain commences in the right iliac region, whence it spreads over the whole abdomen. There is, in most cases, fulness or increased tension, with tenderness on pressure, in the right iliac region, and a swelling can be detected in that locality by examination through the rectum. There is also a line of dulness on percussion above Poupart's ligament (Fig. 11). In other instances these signs are absent, but dul-

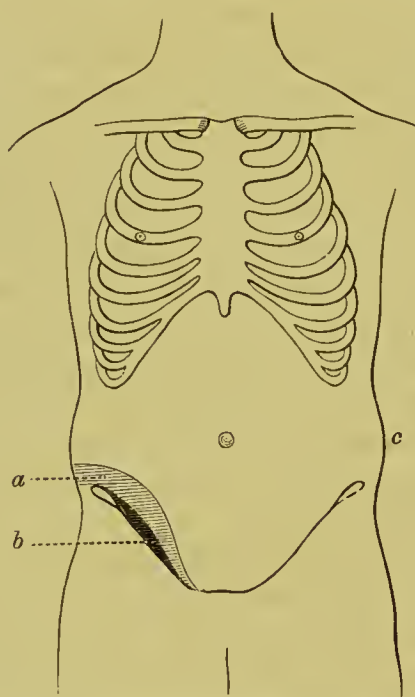


FIG. 11.—Diagram of the physical signs in some cases of perforation of the appendix. *a*, gurgling on percussion, increased resistance and tenderness on pressure; *b*, comparative dulness on percussion, pelvic tumour; *c*, whole abdomen distended, tender, and tympanitic on percussion.

ness can be made out posteriorly, between the last rib and the ilium, and sometimes the presence of air and fluid can be detected in this situation by percussion (see Fig. 12). Although most of these cases end fatally a few recover, the appendix becoming attached by adhesions to some of the neighbouring structures. When you have, therefore, reason to suspect that acute perito-

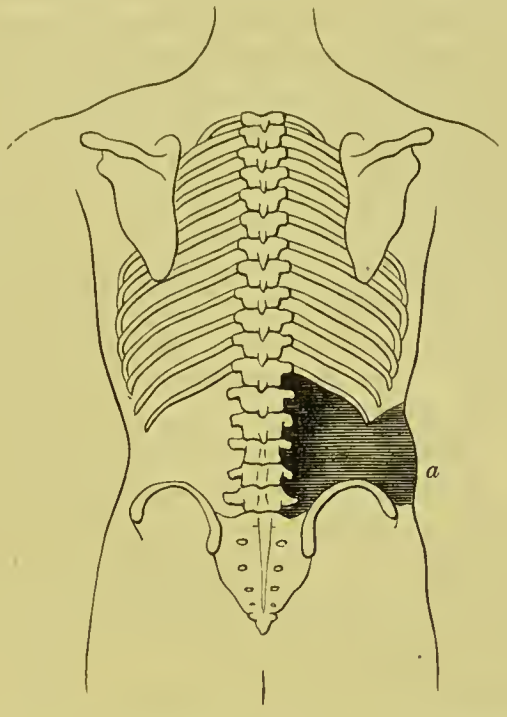


FIG. 12.—Diagram of the physical signs in some cases of perforation of the appendix. *a*, tenderness on pressure, swelling, dulness on percussion, often gurgle, no pelvic tumour.

nitis has been set up by this accident, you should confine the patient strictly to bed, allowing him only small quantities of milk or ice, and maintaining the intestines at rest by means of frequent doses of opium. If at the end of three or four days there are no marked signs of improvement, an incision should be carefully made, and pus sought for in the neighbourhood of the appendix. If it be found, a drainage-tube should be inserted, and the patient placed in such a position as will allow of the ready escape of the pus. When suppuration has taken place behind the cæcum, a double opening may be necessary. Avoid, as far as possible, much disturbance of the parts, as the recent adhesions that surround the abscess are readily ruptured; and if this takes place, the irritating exudations will find their way into the cavity of the peritoneum.

When pus has resulted from inflammation around the uterus or its appendages, an early opening is necessary.

B. *Fr.*—In robust subjects venesection, or the application of leeches (20 to 40) to the abdomen. In feeble persons, or in cases of perforation, no leeches or venesection. In most instances ice-cold cloths, renewed every ten minutes, to the abdomen, or an ice-bag, until the pain abates. In some, hot fomentations afford more relief. In very severe cases, frictions of mercurial ointment to the thighs. Where there is much depression give stimulants.

Germ.—Applications of ice to the abdomen; if it cannot be borne, use hot fomentations. Leeches only in local peritonitis.

C. *Amer.*—(Alonzo Clark.) Opium should be given freely, beginning with 2 or 3 grs.; two hours afterwards notice its effects. "If any of the opium symptoms have appeared, repeat the dose; if none, increase by one grain, and so on at intervals of two hours till the degree of tolerance of the patient is ascertained. The drug symptoms to be produced are as follows:—Subsidence or marked diminution of the pain; some or considerable tendency to sleep; contraction of the pupils; reduction of the breathing to twelve respirations in the minute." If the kidneys are diseased this treatment should not be employed.

Fr.—In peritonitis from perforation, opium should be given; the patient must have perfect rest.

Germ.—Applications of mercury or iodine are quite useless. Opium is the chief remedy (1 gr. of extract of opium every hour until the patient is relieved of pain). Subcutaneous injections only to be used where it is necessary to give rapid relief.

G. *Fr.*—The bowels, when necessary, may be opened by a suppository containing 2 drops of croton oil. This is better than an enema. If tympanites be producing danger, a long rectal tube should be employed to remove it. If there be an excessive amount of liquid effusion, it should be removed by the aspirator.

Germ.—If tympanites is excessive, use a rectal tube.

SECTION II.

Chronic Diseases of the Peritoneum.

Chronic General Peritonitis.

Prognosis.—Chronic peritonitis occasionally follows an acute attack, but it is usually the result of a tubercular or cancerous affection of the serous membrane. Cases of tubercular peri-

tonitis sometimes recover, the intestines becoming adherent to each other, but they usually terminate fatally by pleurisy or tubercular phthisis. Some instances of children are recorded, where recovery took place, even after suppuration occurred and the pus had burst through the navel. Cancerous peritonitis is a hopeless disease, and you can only look forward to a fatal termination. There is a form of this complaint which may readily mislead you. It begins with occasional griping pains of the abdomen, unattended by fever or the ordinary signs of peritonitis. The pains gradually increase in frequency and severity, and the peritoneum eventually becomes distended with fluid. After death the whole of the serous membrane is found to be covered with small cancerous nodules, of the size and appearance of miliary tubercles.

Treatment (p. 30).—During the whole progress of chronic peritonitis, the patient is liable to attacks of acute or subacute inflammation, attended with an increase of pain and tenderness and with an elevation of the temperature of the body. Under such circumstances you must attempt to relieve the symptoms, as in acute inflammatiou, by means of rest in the recumbent position, opium, poultices, and, if necessary, with leeches. In the intervals of the acute attacks the treatment must be in conformity with the general principles laid down for chronic inflammation.

F. The diet should consist of nutritious but readily digestible food. Liquid nourishment ought to be preferred, such as beef tea, veal or mutton broth, milk and farinaceous food, because it is necessary that the enfeebled muscular coat of the intestines should be encumbered with as little feculent matter as possible. In most cases a certain quantity of alcoholic stimulant is useful.

In cancer, small doses of iron, such as the saccharated carbonate or the citrate (F. 201), are useful. Where the appetite is defective, you may combine iron with quinine, calumba, or some other bitter. In tubercular peritonitis, the syrup of iodide of iron, along with cod-liver oil, is valuable. Where, however, there is a tendency to diarrhœa, from the co-existence of ulcerations of the mucous membrane of the intestines, the oil must be used with caution. When there is not much tenderness, the linimentum hydrargyri should be rubbed into the abdomen twice

a day; or if there is any contra-indication to mercury, iodide ointment may be used. In children, the liniment should be diluted with oil. The abdomen should be supported by a flannel bandage.

The action of the bowels generally requires to be regulated. All severe purgatives should be avoided, and, if aperients are necessary, you may prescribe enemata of warm water, confection of senna, compound rhubarb powder, or the compound liquorice powder. The more active aperients are apt to increase the peritonitis, by the irritation of the intestines they produce.

G. Whenever you have reason to suspect that suppuration has taken place, an opening should be made, the fluid evacuated, and a drainage-tube introduced. This rule is applicable to all cases, whether tubercular or otherwise.

Pain is the chief symptom you are called upon to treat; hence opium, administered subcutaneously, epidermically, by the mouth, or enema, will be constantly required. In cancer, chloral combined with bromide of potassium (F. 109) often answers as well as or better than morphine.

Amer.—Full doses of iodide of potassium or iodide of iron should be prescribed. A solution of iodide in olive oil (7 or 10 grs., up to 30 grs., to 1 oz.) may be rubbed on the abdomen, which should be afterwards covered with oil-silk.

Germ.—Poultices or fomentations should be continuously applied to the abdomen. Iodide of iron or iodide of potassium may be given internally.

CHAPTER XI.

DISEASES OF THE LIVER.

As a congested state of the liver is one of the most common conditions we meet with, we have to consider by what measures the hepatic circulation may be quickened. Bodily exercise is the most important of these, as the flow of blood through the liver is greatly assisted by the general excitement of the vascular system resulting from muscular motion. In addition to this, the more rapid action of the diaphragm, consequent on exercise, assists in propelling forward the sluggish streams of blood through the portal veins.

The selection of an appropriate diet is most important, in order to relieve congestion of the liver. It should be sparing in quantity, so that no great excess of nutriment may enter the portal system during digestion, for the activity of the hepatic cells is in proportion to the amount of the food absorbed. Articles composed of starch, or containing much fat or oil, tend to increase the functional activity of the organ, and thereby determine to it an increased quantity of blood. Alcohol, for the same reason, should as a general rule be prohibited, and, where its use seems desirable, it should be given much diluted and in small quantities. A moderate amount of lean animal food, or of fish, together with green vegetables and fruit, forms the best diet for persons suffering from hepatic congestion.

The most important drugs that act on the liver are saline purgatives, mercury, podophyllin, euonymin, leptandrin, taraxacum, inspissated ox-gall, the mineral acids, chloride of ammonium, phosphate of sodium, and salicylate of sodium.

All active purgatives probably tend to relieve hepatic congestion, by draining off a quantity of serum from the portal system,

and by sweeping away the bile that is being continually reabsorbed from the intestines, and again secreted by the hepatic cells. The saline aperients, such as the sulphates of magnesium and sodium, and the purgative mineral waters of Friedrichshall, Pullna, and Carlsbad, are very useful for this purpose.

Various drugs are supposed to quicken the hepatic circulation by increasing the excretion of bile. Of these, the preparations of mercury are the most efficacious. They are to be preferred to other cholagogues, where the patient presents the symptoms of acute or chronic gastric catarrh, or when the evacuations are fetid or of a pale colour. In acute cases, calomel, in doses of two to five grains, followed, if necessary, by a saline aperient, is to be preferred ; for more chronic cases you may use blue pill or the compound calomel pill, repeated as often as seems desirable. Mercury should not be given, except for very urgent reasons, in disease of the kidneys, or when the patient is feeble or anæmic. Podophyllin, leptandrin, and euonymin are better fitted for cases of chronic hepatic congestion, where it is necessary to keep up the action of the liver for a considerable length of time. Inspissated ox-gall is employed, usually in combination with other aperients, where long-standing constipation appears to be connected with an imperfect secretion of bile. The dilute mineral acids, rhubarb, and taraxacum are usually preferred where defective biliary secretion is attended by an atonic condition of the stomach and intestinal canal. They are of comparatively little value in cases of hepatic congestion associated with gastric catarrh. The chloride of ammonium and the phosphate and the salicylate of sodium are often used with advantage in the more chronic forms of hepatic disorders, as they increase the quantity of the bile and render it more liquid.

In chronic hepatic congestion, especially when the disease has been contracted in tropical climates, the nitro-hydrochloric acid may be employed externally. Eight ounces of the dilute nitro-hydrochloric acid of the 'Pharmacopœia' should be added to one gallon of water at 96° F. When it is desirable to use the acid locally, a flannel bandage wet with this, and wrung out until it is only damp, should be applied round the abdomen and covered externally with oil-silk. It may be worn constantly, and reapplied night and morning, unless much irritation of the skin be

produced, when it should be worn only for a few hours at a time. In some cases it is more useful to employ the acid as a foot-bath or as a general bath two or three times a week. The bath may consist of two ounces of strong hydrochloric and one ounce of strong nitric acid to two gallons of water, at a temperature of 96° to 98° F. Both feet are to be placed in the bath, and the inside of the legs and arms and the front of the abdomen should be sponged for half an hour at a time night and morning. The bath may be kept ready for use by adding one drachm of hydrochloric acid and half a drachm of nitric acid with a pint of water each day, to make up for the loss by evaporation, and about a fourth of the liquid should be heated in an earthen pipkin, to bring it up to the required temperature. Glazed earthen or wooden vessels should be alone used, and the sponges and towels must be kept in cold water to prevent them being spoiled by the acids. The carpets should be removed from the floor of the room in which the bath is used.

SECTION I.

Morbid States not necessarily Dependent on Organic Disease.

Complete abolition of the secreting power of the liver is met with in acute atrophy and some other disorders, and is named "Acholia." It is characterised by delirium, increased rapidity of the pulse, alteration in the temperature of the body, and hæmorrhage from the mucous membranes. It usually terminates fatally. The urine contains tyrosine and leucine, which partially or entirely replace the urea and uric acid. As, however, this condition seems only to occur along with extensive disorganisation of the liver, we have no means either of prevention or of cure, but are obliged to content ourselves with treating such symptoms as seem to be most pressing.

Jaundice.

Whenever there is an obstruction to the free egress of bile from the liver, absorption occurs through the medium of the lymphatics, and jaundice is produced. Yellowness of the skin and other tissues, although to a smaller extent, also accompanies various febrile affections, pyæmia and septicæmia, and disorganisation of the hepatic tissue, as in acute yellow atrophy, &c. With respect to the latter class of diseases, the prognosis and treatment of the jaundice depend entirely upon the nature of the malady, of which it is only a symptom. Consequently, we must at present confine our attention to jauudice arising from obstruction.

Prognosis.—The prospect of recovery is dependent chiefly on the nature of the condition that has produced the jaundice. The catarrhal form generally lasts from ten to twenty days, and ends in recovery, although it is not unfrequently followed by obstinate dyspepsia. This is more particularly the case when repeated attacks have taken place, because obstruction of the duct is often produced by chronic inflammation of the mucous membrane of the duodenum. Jaundice arising from gall-stones is not unfrequently of only a few days' duration, commencing during or immediately after the passing of the calculus, and subsiding as soon as the catarrh excited by the irritation has had time to disappear. The gall-duct may, however, be permanently, or for a long period, obstructed, either by a calculus becoming impacted, or by thickening resulting from the inflammation. Recovery may occur even after twelve or eighteen months of partial jaundice, but generally in very chronic cases atrophy of the hepatic structure results, and death is the consequence. When the duct has become partially or entirely closed by cancer of the pancreas, enlarged lymphatic glands, or by other growths, the case always terminates fatally, although its duration varies according to the seat and nature of the disease.

If the cause producing the complaint is obscure, it will be useful to bear in mind that the prognosis is generally favorable in the young, doubtful when the patient is of middle age, and unfavorable in advanced life, because malignant tumours are

more apt to occur at the latter period. Females are generally the subjects of biliary calculi, and the prospect is therefore more favorable in them than in males. Fever is rarely an accompaniment of uncomplicated jaundice. If, therefore, you find any considerable and continuous elevation of temperature, you should suspect some complication, such as hepatitis, perihepatitis, or abscess of the liver, ducts, or gall-bladder, and you must be consequently cautious in your prognosis.

Treatment.—Where the jaundice is the result of cancerous or other growths compressing the ducts, the treatment must be directed to relieve the primary malady. If it is caused, as is generally the case, by catarrh of the ducts or duodenum, or if it arises from the irritation of a calculus, the principles of treatment are the same as those required for catarrhal inflammation of any other mucous membrane (p. 16).

A. It is seldom you can remove the cause, excepting where a mass of hardened fæces is pressing upon and obstructing the duct. In such a case a dose of calomel and extract of colocynth (F. 165), followed by a saline aperient, will often suffice to cure the complaint in a few days.

B. Where there is much tenderness on pressure over the gall-bladder or ducts, you will hasten the recovery by the application of six or eight leeches, followed by poultices and fomentations. Remember, however, that jaundiced patients bleed more freely than others, and you should, therefore, give directions how the hæmorrhage can be arrested in case this should be necessary. If the tenderness be slight you may employ dry cupping, or content yourself with the application of hot poultices. The bowels are usually confined, and you may prescribe a dose of calomel and colocynth, or of Pil. Hydrarg. and colocynth (F. 160), followed by a saline aperient, such as the sulphate and carbonate of magnesium (F. 148). If the tongue is foul, the calomel may be repeated every few days, or you may give some saline aperient alone each morning. At an early period of the complaint you must not prescribe hepatic stimulants, such as podophyllin or euonymin, but content yourself with lessening the congestion of the liver and its ducts. Large enemata of cold water have been strongly recommended, but I have not found them of much value. The method of using them is to

allow one to two pints, at a temperature of 59° F., to flow into the rectum from an irrigator, the fluid being retained as long as possible. The injection should be repeated each day, but the temperature must be gradually raised to 72° F.

D. When the case is recent and severe, you should confine the patient to the bed or sofa ; at the same time all excitement of the liver must be prevented, and, consequently, alcoholic beverages, coffee, cocoa, and food containing much fat, starch, or sugar, should be forbidden. The most suitable diet consists of beef tea, chicken or other animal broths, skimmed milk, and raw or cooked fruits. Where the complaint persists for more than two or three weeks solid food may be allowed.

G. When the jaundice has continued for more than two or three weeks, it is reasonable to suppose that the tubes are choked with inspissated mucus, or that their muscular coat has become enfeebled from inaction. You should, therefore, stimulate the liver to increased secretion. The nitro-hydrochloric acid is the most useful means for effecting this object (F. 210). It may be prescribed along with a saline aperient, or its action assisted by podophyllin, leptandrin, or mercury ; or it may be used externally by means of a bandage applied round the abdomen, or as a bath. When you suspect thickening of the duct to be taking place, blisters should be employed, and the perchloride (F. 4) or the iodide or mercury ought to be given internally. In either of the above cases you must prescribe a more stimulating diet.

Itching of the skin often precedes jaundice, but in other cases it is present during the whole course of the disease. It is always difficult to relieve, but the internal administration of bicarbonate of potassium is sometimes effectual. Usually a warm alkaline bath soothes the irritation, whilst acid baths increase it; but Murchison mentions a case in which acetic acid baths (half a pint of acid to three gallons of water) afforded relief. In other instances you may employ a liniment containing oil, lime water, and hydrocyanic acid, or a lotion of carbonate of potassium (℥j to Oj). In old people, the itching is sometimes so obstinate that relief can only be obtained by the use of a flesh-brush every night. It is better to give some sedative, such as chloral, at bedtime, rather than permit the patient to suffer from want of sleep for a length of time.

The yellowness often remains in the skin long after the stools present evidence of a free egress of bile into the duodenum, and patients are apt to be dissatisfied if you make no attempt to remove the colour. The skin and the kidneys are the chief eliminators of bile from the system. You will find the former best stimulated by vapour-baths and baths of bicarbonate of sodium, whilst the urinary secretion may be augmented by alkaline diuretics, such as the acetate of potassium, which may be combined with the spirit of nitrous ether and decoction of scoparium. Benzoate of sodium has been strongly recommended for the purpose of removing the yellowness of the skin that sometimes remains after jaundice has disappeared.

A tendency to hæmorrhage is probably always present. In recent cases you will generally discover a few small ecchymoses over the chest or abdomen, and in chronic jaundice there is often severe bleeding from the gums, nose, or other mucous membranes. Be careful to ascertain the exact spot from which the bleeding proceeds, for local applications are much more effective than medicines given by the mouth. A solution of perchloride of iron, tannic acid, or turpentine will often quickly arrest the hæmorrhage, if applied to the affected part, when styptics given internally are without avail. Whenever there is a tendency to hæmorrhage, you should prescribe acids, with or without quinine or cinchona. The nitro-hydrochloric acid (F. 210) answers best, but the sulphuric may be prescribed if, for any reason, its administration be thought desirable.

Hepatic Neuralgia.

The liver is not endowed with much sensibility, and consequently most of the pains referred to its neighbourhood arise from inflammation of the peritoneum, or from an affection of some other organ situated near it. Pain and tenderness in the right hypochondriac and epigastric regions are not unfrequently produced by the irritation of hydatid and other tumours. In other cases the gall-bladder seems to be the seat of the suffering. More commonly, pain in this part of the abdomen is caused by an accumulation in, or some abnormal condition of, the colon.

Do not forget, however, that the pleurisy attending phthisis may produce pain referred to the under surface of the hypochondrium, and that considerable tenderness on pressure often accompanies it. In all probability the tenderness is caused by the pressing upwards of the liver against the inflamed pleura that covers the upper surface of the diaphragm. Pain in the back may arise from spinal disease, pleurisy, herpes zoster, or from irritation of the gall-bladder or right kidney.

SECTION II.

Acute Diseases of the Liver.

Acute Yellow Atrophy.

Prognosis.—Although this affection is most common in pregnant females, it is not confined to them. It may even attack children, but this is of rare occurrence. Some cases presenting all the symptoms of the disorder have terminated favorably, but, as a rule, it is almost always fatal, ending usually within one week from the first appearance of the delirium. The average duration of a number of cases is said to have been five days, but it has in some instances caused death in thirty-six hours. You should carefully ascertain that the normal dulness presented by the liver on percussion is greatly diminished; for jaundice, attended with fever and cerebral symptoms, may be due to typhus or abscess of the liver, as well as to acute atrophy.

Treatment.—Various methods of treatment have been recommended. Some have employed emetics or saline purgatives (F. 146), whilst others have relied on the internal use of acids (F. 48). The almost uniform fatality of the disease is a sufficient proof that none of these methods of treatment are of much value. It will be better, as we are ignorant of the causes producing the complaint, to follow the ordinary indications for the treatment of febrile disorders.

A. If the bowels have been much constipated, it will be well

to follow the advice given by some authors of acting on the portal system by saline aperients. When this has not been the case, purgatives are not likely to be of benefit.

B. As the pulse is always weak and compressible, it is not wise to diminish the amount of blood. On the contrary, most cases require alcohol or ether, in addition to frequent doses of bark or quinine, combined with acids (F. 215).

C. You should not use sedatives unnecessarily, as the delirium results from the imperfect excretion of the products of decomposition, and opium tends to favour their retention in the system. Some authors have advised that, as soon as cerebral symptoms supervene, the patient should be treated with diaphoretics or diuretics, combined with colchicum, so as to increase the elimination of the urea. If the heat of the skin should be excessive, which is not usually the case, cold sponging may be employed, and large doses of quinine administered.

D. The state of the patient necessitates perfect rest in bed. The delirium is usually of a low, muttering character. Air should be freely admitted into the room, which must be maintained at a moderate temperature.

The chief complications are obstinate vomiting, and hæmorrhage from various mucous membranes. The vomiting arises from the implication of the nervous system, and is best treated by ice, hydrocyanic acid administered in an effervescent mixture, and the application of a mustard poultice over the pit of the stomach. You must combat the hæmorrhage as in other cases of jaundice.

Abscess of the Liver.

Prognosis.—The probability of recovery depends greatly on the cause of the disease. When it arises from pyæmia or suppuration of the gall-ducts the patient rarely survives, as there are numerous abscesses scattered through the organ, and the whole system is affected by the absorption of septic material. Although hepatic abscess is usually an acute affection, cases sometimes live for many weeks or even months. Recovery from this form of hepatic abscess has been recorded, but such a fortunate termination is rare.

The prognosis of the tropical form is more favorable, as, in most of the cases that occur in this country, the pus has become encysted. In addition to this there is generally only a single abscess, which may be evacuated, and recovery may ensue. Although hepatitis ending in abscess is chiefly observed in persons who have resided in hot climates, it occasionally presents itself in those who have always lived in this country.

The condition of the walls of the abscess is best discovered by an examination of the pus removed by the trocar. If large fragments of liver or connective tissue are present, it will be sufficient to shake it up with distilled water, when the heavier particles can be removed with a pipette as fast as they subside. In other cases you may digest the pus for a few minutes with distilled water containing a few drops of ammonia. On this being poured into a conical glass, any fragments it may contain can be removed, and examined with the microscope. If no particles can be detected, there is ground for believing that the contents of the abscess have been encysted. Where fragments are present, you may estimate the danger of the case by noting their size and number. The abscess may, however, burst into one of the neighbouring organs, or through the parietes of the abdomen. Of thirty-nine cases of recovery, collected by Rouis, seventeen burst through the abdominal or thoracic walls, fifteen opened into the bronchi, three into the stomach, and four into the colon.

Treatment (p. 24).—**A.** In pyæmic abscess the treatment must be directed to the constitutional disorder, the hepatic suppuration being only a consequence of it. In order to arrest pyæmia, it has been proposed by some foreign practitioners to treat the patient with the sulphites of sodium or potassium, or the sulphocarbolate of sodium; but in this country both of the above drugs, as well as the subcutaneous injection of carbolic acid, have proved useless for this purpose. Most benefit has been obtained from frequent and large doses of quinine, combined with acids. In tropical abscess you should carefully inquire into the state of the colon, as ulceration of its mucous membrane is a very common accompaniment or cause of the affection of the liver.

B. When acute hepatitis has resulted from a direct injury, you

are advised to employ venesection or leeches. Such cases are, however, rare, and bleeding is out of the question with the rapid, compressible pulse of pyæmia or tropical abscess.

In the early stage of tropical abscess, if the patient is strong and the pain excessive, a few leeches may be applied, but this is very rarely necessary. Mercury, which was formerly employed to prevent the formation of abscess, is now universally condemned, and reliance is chiefly placed on the administration of ipecacuanha, as in cases of dysentery. The hepatic region should be covered with a large hot poultice, and dry cupping or sedative fomentations may be employed if the pain be severe.

It is generally necessary to support the action of the heart by means of alcohol, ammonia, or ether.

C. Sedatives are always required to relieve pain and procure sleep. Morphine may be given, either subcutaneously or by the mouth. The latter method of administration is to be preferred where there is diarrhœa, but it is better to give it subcutaneously when there is much tendency to vomiting. The hydrate of chloral is in some cases more useful than opium ; others prefer a full dose of the compound tincture of camphor, as being less apt to derange the digestive organs.

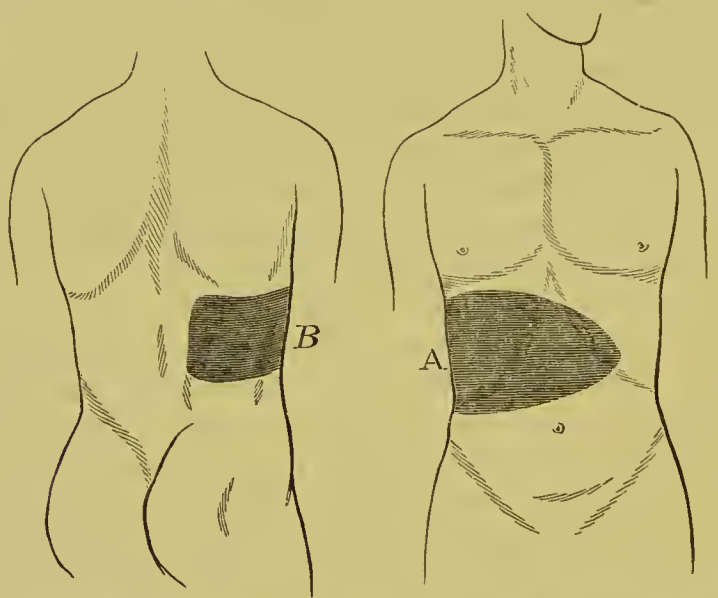
D. Insist upon rest in bed. Usually the patient is too ill to sit up, but occasionally he is inclined to walk about, after signs of suppuration have shown themselves.

G. The chief point in the treatment is the evacuation of the pus. You rarely can detect the abscesses in pyæmia, on account of their small size. In tropical cases you must search, both in the epigastric region and on the sides of the chest and back, for any signs of suppuration. Press your fingers deeply between the ribs, and very carefully examine if any elasticity can be discovered. If so, enter the trocar or an aspirator at the affected part. If the instrument is of small size no harm will be done by the puncture, even if it prove unsuccessful, whilst you may save the life of your patient by evacuating a collection of pus. You rarely succeed in emptying the cavity at once, because the liver is not capable of expansion like the lung. It is generally necessary, therefore, to repeat the operation from time to time.

The following rules are laid down by Sir Joseph Fayrer :—

1. In all cases where there is a visible fluctuating tumour, operate

at once. 2. Explore with the aspirator in cases where the symptoms of abscess of the liver are present, with a distinct tumour projecting from the normal contour of the liver, or causing bulging of the ribs, though there be no perceptible fluctuation. 3. Explore, when symptoms of abscess co-exist with uniform enlargement of the liver, but with no distinct tumour or bulging, if there be any local œdema, obliteration of an intercostal space, or pain localised to one spot when pressure is made upon it, or when the patient takes a full inspiration. 4. Explore where there are no signs of abscess, but where the constitutional symptoms are severe and leave little doubt of its existence. 5. Where, from the presence of jaundice or other symptoms, there is reason to fear there are numerous abscesses, it will be better to abstain from any operation.* The points at which a liver abscess may be explored or punctured are indicated in the following diagrams (Figs. 13, 14).



FIGS. 13 and 14 show the site of puncture for hepatic abscess. The shaded *A* and *B* indicate the areas on the front and back of the body respectively, within which the punctures for hepatic abscess may be made (Sir JOSEPH FAYRER).

E. In the intervals of tapping, or in any case where you suspect suppuration, you must support the strength of the

* 'Clinical Lectures on Diseases of the Liver,' by Dr. Murchison, p. 214.

patient by alcohol in various forms, soup, beef tea, jellies, milk, and farinaceous food. Quinine, combined with acid (F. 215), forms the most useful tonic.

B. *Amer.*—At the onset, a large dose of quinine with a little morphia may be given. Saline aperients are useful.

Fr.—When the disease has arisen from a calculus or an accident, ice should be applied to the hepatic region, leeches to the anus, and repeated purgatives should be prescribed. To prevent the formation of pus, calomel in small doses is recommended, but its utility is very doubtful.

Germ.—Local bleeding, emetics, and purgatives are advised; they are not of much use in preventing suppuration.

C. *Amer.*—In case of vomiting, effervescent medicines, carbolic acid, creasote, or bismuth may be given.

G. *Amer.*—Exploratory puncture of the liver is free from any ill effects, even if pus is not present. As soon as the diagnosis of pus is certain, an aspirator should be introduced. When the abscess is large, a free opening must be made and a drainage-tube inserted.

Fr.—When the abscess is situated in the epigastrium or below the ribs, caustics may be used, so as to set up adhesions, before a puncture is made; but when the fluctuation is between the ribs it is better to tap at once. Injections of iodine or alcohol are required when the cavity is large.

Germ.—The abscess should be emptied as soon as its diagnosis is certain.

Congestion of the Liver.

Prognosis.—This may occur as an acute or chronic condition. The probability that the organ will be restored to its normal state is usually in proportion to the rapidity with which the enlargement has occurred. It is very rare that the patient dies from hepatic congestion, but, by the impediment it causes to the circulation through the gastro-intestinal membrane, most of the cases of chronic gastric catarrh, so common in medical practice, are produced. The prospect of recovery in chronic cases is to be determined mainly by a consideration of the cause from which it has arisen. Where, for instance, it has resulted from excess in eating or drinking, it depends on whether the patient can refrain from his accustomed indulgence. In malarial cases the prognosis is usually favorable if you can remove the patient

to a dry and healthy climate, or otherwise overcome the effects of the malarial poison. In heart disease it is an evidence that the right side is dilated, and that the case is approaching its final stage.

Treatment (p. 24).—Although congestion is different pathologically from inflammation, the indications are the same.

A. In most cases the line of treatment must depend on the cause of the disease. If malarial, give quinine freely, or, if this fails, arsenic (F. 225). The patient usually requires a moderate amount of alcohol with his food. When from diseased heart, and attended by dropsy and dyspnœa, you must prescribe rest, along with digitalis and other diuretics (F. 90); but you will constantly find digitalis does not act until you add mercury to it (F. 99). This should be continued until the gums become sore, when the amount of the urinary secretion often suddenly increases. When you find mercury, given internally, produces irritation of the gastro-intestinal tract, you may order the mercurial ointment to be rubbed into the region of the liver, night and morning. This is often more efficacious than the internal administration of the drug.

B. It is rarely necessary to use venesection. When it arises from over-indulgence in eating or drinking, leeches to the hypochondrium or to the anus are useful. The anus is to be preferred where there is a history of previous bleeding from piles. Where you cannot use leeches, you may often employ dry cupping or sinapisms to the epigastrium with great benefit.

You can lessen the engorgement of the liver either by draining some of the fluid parts of the blood from the portal veins by purgatives, or by stimulating the secretion of the liver, and thus tapping the vessels whilst passing through the organ.

Hydragogue cathartics best effect the first of these objects. Friedrichshall and Pullna water, or Carlsbad salt, are popular remedies for biliousness, which they remove in this way. You should restrict this method to young and plethoric persons, and do not continue it for any length of time without adding a stimulant or tonic to the saline. Of the various saline aperients the phosphate of sodium is one of the most valuable, or the sulphate of sodium (F. 151), or magnesia, or the sodic tartrate may be prescribed, and combined, if necessary, with quinine or

some other bitter. Iron is rarely of benefit; it usually disorders the digestive functions.

You may effect the same object in persons of a more feeble state of health, and whose vascular system is not overloaded, by cholagogues. Thus a few successive and moderate doses of calomel (F. 161), or blue pill (F. 160), followed by a saline aperient next morning, often produce less depression than a long course of the salines alone. When there is much irritability of the gastro-intestinal tract, small doses of calomel ($\frac{1}{4}$ gr. or $\frac{1}{2}$ gr.), given two or three times a day, are often of great service. If mercurials are not desirable, you may prescribe podophyllin (F. 162), leptandrin, euonymin, or taraxacum (F. 15). What is most generally useful is a mixture of soda or potash along with rhubarb (F. 213). In old people, especially where there is much constipation, an electuary of senna (F. 132), guaiacum, or sulphur answers a similar purpose.

In very chronic cases, when the feebleness of your patient forbids the use of all active treatment, you may employ acid baths or bandages, or give acids internally (F. 210), along with a mild aperient. It is in chronic cases that the chloride of ammonium, in doses of ten to twenty grains three times a day, often proves so valuable. If you have reason to suspect syphilis the iodide of potassium or perchloride of mercury must be given, and continued for some time.

D. In the acute form bodily rest is to be recommended. In chronic congestion, especially where it arises from indolence or indulgence in eating, regular exercise in the open air is essential. You may also promote the circulation through the liver by frictions with iodine or other stimulating substances.

E. The diet should be sparing in quantity. Alcohol, coffee, spices, and other stimulants to the digestive organs must be prohibited, and the patient should not indulge in too frequent meals. When the disorder has arisen from over-indulgence in eating or drinking, you must restrict him to well-cooked vegetables, fruits, skimmed milk, fish, or lean meat; but if there is much gastro-intestinal catarrh, an absolute milk diet will be found valuable.

SECTION III.

Chronic Diseases of the Liver.

Cirrhosis.

As this disease ordinarily arises from the abuse of alcohol, your chance of relieving the patient chiefly depends upon his power of abstaining from all fermented liquors. Without this all your endeavours to cure him will prove fruitless.

In the first stage—that is, before dropsy has taken place—the symptoms are similar to those of chronic hepatic congestion, and there is usually a reasonable probability of a successful result. As soon as ascites has shown itself, the chance of a favorable issue is greatly diminished, and the more rapidly the fluid increases the more imminent is the danger. Nevertheless, if there is no fever and no complication, you may in many cases afford relief, although the patient seldom, if ever, regains a perfect state of health.

Hæmatemesis is apt to occur before dropsy has shown itself. It is always a sign of ill omen, for persons habituated to excess in alcohol bear the loss of blood badly. It is apt to recur from time to time, and therefore, however well the patient may have borne the first hæmorrhage, you should watch him closely, and give a very cautious prognosis.

Treatment (p. 32).—Before the occurrence of ascites the treatment is precisely similar to that required for chronic congestion. In the first place, endeavour to put a complete stop to the habit of spirit-drinking. It is of little use to counsel moderation; you can only do good by resolutely insisting upon perfect abstinence from alcohol. If it is impossible to attain this object, you may allow some light wine, such as claret or hock, in moderate quantities.

In many cases the symptoms subside very slowly, and you may then with great benefit prescribe a prolonged course of iodide of potassium (F. 8), with an occasional dose of blue pill

(F. 160). This is more especially useful where you have reason to suspect the patient has suffered from syphilis.

Attacks of perihepatitis may require, in plethoric subjects, the use of leeches, followed by hot fomentations or poultices; but when there is general debility you must content yourself with the application of a small blister to the part. In chronic cases, where there is pain but not much tenderness, the iodine liniment may be painted over the hepatic region night and morning until the skin becomes sore. The pain is seldom so severe as to require sedatives, but if it prevents the patient sleeping, a dose of Dover's powder, combined with a grain or two of calomel, may be given each night. When the pain has subsided, a flannel or silk bandage should be worn around the hypochondrium, so as to maintain the organ as much as possible at rest.

After ascites has shown itself, the indications are the same as those for other forms of dropsy (p. 34).

A. The cause of the exudation into the peritoneum is the organisation and contraction of the lymph effused into the portal canals, and the consequent obstruction to the circulation. Put a stop, therefore, to all stimulants, especially to alcohol, which tends to increase the exudation around the portal veins. Mercury has been supposed to have a specific action upon the liver, and in the treatment of this form of dropsy it is invaluable. You may use blue pill, but we generally prefer the perchloride of mercury in solution (F. 4). It must be continued for many weeks or months, according to the obstinacy of the case, and decisive results are seldom obtained until the gums become sore. As soon as this is observed you should diminish the dose, but you must persevere with its use until the ascites has entirely disappeared.

Perfect rest in bed is essential to success, in order to lessen the congestion of the portal vessels, and to save the strength of the patient. Keep him on liquid food, such as soup, beef tea, jellies, and milk.

F. To give time for the mercury to produce good results, you must keep up a brisk action on the portal system. This is best effected by the compound powder of jalap, with or without the addition of gamboge (F. 168), or by saline aperients (F. 148).

The dose should be sufficient to produce two or three liquid evacuations daily at the commencement of the treatment, but a less amount of purging will suffice as the dropsy decreases. Where the urine is very scanty, or the heart dilated, you may add digitalis to the mercury. It is advisable to give the aperients early in the morning before food, so that they may act freely on the bowels, at the same time that they do not carry off any food that is undergoing the process of digestion. Irritating purgatives, such as croton oil and elaterium, should be prescribed with caution, as attacks of enteritis sometimes occur in these cases. Diuretics, although they are usually prescribed, are not of much use in the ascites arising from cirrhosis. The best are the acetate of potassium, benzoate of ammonium, and the infusion of digitalis. The resin of copaiba (F. 98) has been strongly recommended, but, according to our experience, its action is very variable, and it is apt to lessen the appetite of the patient.

G. It rarely happens that the action of purgatives alone is sufficient to reduce the swelling. You must, therefore, resort to tapping, and repeat it as often as the breathing becomes difficult, or signs of œdema of the lungs present themselves. You should tap at an early stage, in order to prevent the fluid in the abdomen compressing the superficial veins which assist in maintaining a circuitous circulation of the venous blood. Use a fine flannel bandage as soon as the ascites seems fairly to have subsided, or you may support the abdomen by strapping.

Obstinate diarrhœa is one of the most troublesome accompaniments of cirrhosis. Unless it greatly reduces the patient's strength you had better leave it alone; but if his pulse begins to fail, you must employ opiate enemata, or astringents, such as logwood (F. 59), or acetate of lead (F. 60).

A. *Amer.*—Let the patient give up coffee, tea, alcohol, and highly seasoned food.

Fr.—If there is a history of syphilis, iodide of potassium should be prescribed. When the cirrhosis is secondary to peritonitis, leeches or cupping may be used.

B. *Amer.*—The chloride of gold and sodium ($\frac{1}{10}$ gr.) may be given, or the perchloride of mercury or phosphate of sodium (1 dr. three times a

day). The most efficient topical application during the hypertrophic stage is the Unguent. Hydrarg. Iodid. Rub. A piece the size of a large pea should be thoroughly rubbed in over the hepatic region daily, until some irritation of the skin is produced.

Germ.—Iodide of potassium is recommended, but its value is very doubtful.

F. *Amer.*—Succulent vegetables, lean meat, and acid fruits form the most suitable diet. A diet of skimmed milk is useful.

Fr.—Milk diet is of no value.

G. *Amer.*—To remove ascites, the warm bath, vapour-bath, digitalis stupes, with the subcutaneous injection of pilocarpine, are most useful. The compound powder of jalap is the best purgative, and podophyllin may be added to it to increase its efficacy. Elaterium is useful. Tapping should be used if necessary.

Fr.—Tap as often as is necessary to relieve the breathing.

Germ.—Tapping must be used if necessary.

Hydatid Cysts of the Liver.

Prognosis.—The prognosis varies greatly in different cases, according to the size and situation, as well as the number, of the cysts that may be present. For example, a single tumour so placed as to be readily reached by operation presents a fair chance of success. Those that have few or no "daughter-cysts" within them are also favorable cases. You may guess at the number of secondary cysts by comparing the amount of fluid you can remove by the trocar with the size of the swelling. Small, deeply seated hydatids are more likely to undergo spontaneous degeneration and cure than those on the exterior of the organ. When the tumour bursts into the colon, there is a more favorable prospect than when a rupture takes place into the lung or bronchial tubes. The bursting of a cyst into the pleura is attended with great danger; perforation of the pericardium or peritoneum is generally fatal.

Treatment.—Various remedies have been recommended, such as common salt, iodide of potassium, &c., in order to destroy the hydatids. They have, however, always failed to produce any effect upon the disease, and the only chance of relieving the patient is by a surgical operation.

The simplest procedure is to tap the cyst with a trocar or

aspirator, by which the fluid contents are removed. Some recommend that the point of the trocar should be moved about in different directions, so as, if possible, to rupture the "daughter-cysts." As soon as the liquid has ceased to flow, you should, as you withdraw the trocar, press the abdominal walls over the part, so as to prevent any escape into the peritoneal sac, and cover the wound with a piece of lint soaked in collodion. The abdomen must be then carefully bandaged, and a dose of morphine administered. The object of the operation is to kill the hydatids by the removal of the fluid in which they live, so that it is not necessary entirely to empty the sac. There is often a rise of temperature for a few days after the operation, and the tumour may become as large as before, but in successful cases the swelling afterwards gradually subsides. Chloroform should not be exhibited before the operation, lest the vomiting that is apt to follow its use should force out some of the contents of the sac into the peritoneum; but the skin may be anæsthetised, by means of ice or ether spray, before the puncture is made.

Others have advised the injection through the cannula of a solution of ox-gall or male fern, under the idea that in this way the vitality of the echinococci might be destroyed. In most cases the tapping alone is sufficient, although you may have to repeat the operation.

When the fluid withdrawn by the trocar proves to be purulent and there are constitutional symptoms, the tumour should be opened by the knife or a large trocar, the contents removed, and a drainage-tube introduced. The cavity should be afterwards washed out with a weak solution of iodine or carbolic acid (2 per cent. solution). Hydatid cysts are not so apt to form adhesions as abscesses of the liver, but you can generally ascertain if this is the case by marking with ink the lowest border of the tumour, then making the patient draw a long breath, and observing if the border descends below the mark. If no alteration of its position is produced, it is tolerably certain that it is fixed to the parietes of the abdomen.

The rupture of a hydatid cyst or of an hepatic abscess into any of the abdominal organs must be treated as other injuries of the parts affected.

In some cases needles were introduced into a hydatid cyst by Dr. Hilton Fagge and Mr. Durham, and a galvanic current directed through them. The current was allowed to pass from ten to twenty minutes at a time.

Amer.—Under favorable circumstances free incision and drainage produce satisfactory results. Puncture is the most simple method of operation, but tapping and electrolysis are also employed.

Fr.—Adhesions may be excited by caustics, the sac opened, and afterwards washed out by an iodine injection.

Germ.—A caustic paste made of chloride of zinc may be applied; it slowly effects the opening of the sac and the subsequent evacuation of its contents.

Cancer of the Liver.

Prognosis.—Cancer of this organ affords no hope of a successful treatment. The progress of malignant disease is usually more rapid when it affects the liver than any other structure. This arises partly because hepatic cancer always grows very quickly, and partly because we almost always find a similar condition of some other of the digestive organs. Most of the cases terminate within nine or twelve months.

Treatment.—As soon as the diagnosis is certainly established you should give up all depressing medicines, such as iodine and mercury, and attempt in every way in your power to maintain the strength of the patient. In addition to a nutritious diet and a moderate allowance of alcohol, you may prescribe the iodide or phosphate of iron, quinine (F. 215), or cinchona (F. 220). Some have advised liquor potassæ along with sarsaparilla, or a course of some bitter infusion. The chief part of the treatment must be necessarily palliative. You may attempt to relieve pain by morphine, given by the mouth or subcutaneously, or, if this fails, you may use hyoscyamus, belladonna, chloral, or bromide of potassium (F. 109). In some cases relief from pain can be afforded by frequent small doses of chloral, even when morphine fails.

Vomiting, diarrhœa, and other symptoms arising from a coexisting affection of the stomach or intestines, present themselves,

but these must be combated according to the principles laid down for their treatment.

Fatty Liver.

Prognosis.—In the majority of cases this affection is only an accompaniment of phthisis or some other wasting disorder, and therefore the probability of recovery depends upon that of the original malady. Where disease of the lungs is absent it is often associated with chronic diarrhœa and general debility. Persons so affected may live for a considerable period in imperfect health, but are supposed by some practitioners to be especially liable to apoplexy. When it has been developed in individuals of indolent and luxurious habits, the condition may be removed by active exercise and a carefully regulated and spare diet.

Treatment.—When associated with phthisis or cancer, the treatment of fatty liver is, of course, subordinate to that of the original disease. In cases of phthisis some advise that cod-liver oil should not be given, but if the oil does not disagree there can be no advantage in withholding so useful a remedy.

When fatty liver occurs independently of other diseases, you must treat it on the same principles as are applicable to other cases of fatty infiltration.

A. Avoid, as far as possible, all food likely to produce fat,—for instance, whatever contains much fatty, saccharine, or starchy material, as well as alcohol, unless the latter is absolutely necessary. Where, however, you have reason to suspect the co-existence of a fatty state of the heart, you must be cautious in withholding alcohol, especially if the patient has been long accustomed to its use. The diet should consist of lean meat, green vegetables, fish, and fruit. Regular exercise in the open air should be ordered, but it should not be so severe as to produce fatigue.

F. Regulate the digestive organs, either by means of alkalies (F. 142), or by acids (F. 211) and other tonics, as the state of the gastro-intestinal canal may seem to require. If anæmia is present, iron is necessary. The bowels must be regulated by

means of rhubarb, aloes, or senna, but all saline purgatives and other lowering remedies should be avoided.

Diarrhœa is the most troublesome symptom, and tends greatly to reduce the strength of the patient. Alkalies and absorbents are not of much use, for the mucous membrane of the gastro-intestinal tract is usually in a state of fatty degeneration similar to that of the liver. You should, therefore, use astringents. Acetate of lead (F. 60), nitrate of silver (F. 52), or sulphate of copper (F. 55), along with opium, is most useful where the purging is of long standing, or where there have been repeated attacks. In recent cases, logwood (F. 47), krameria, kino, or catechu, with or without opium, is more beneficial than the metallic astringents.

Lardaceous Disease of the Liver.

Prognosis.—As this is only a local expression of a wide-spread disorder of the system, the prognosis depends, not only on the amount of hepatic enlargement, but on the other circumstances of the case. It is more serious when it presents itself in conjunction with phthisis than with syphilis; for it is believed that the latter is the most curable form of the disease. The greater the number of organs affected, the less favorable is the prognosis. If, for example, the liver, spleen, and kidneys are all implicated, you would look upon the case as more dangerous than where only one was attacked. The greater the rapidity with which the malady has increased, the more serious is the aspect of the case, as the quick extension from one structure to another shows that the general health is greatly impaired. Cases are quoted in which the progress was so slow as to extend over many years, and some authors have affirmed that they have seen the enlargement of the liver gradually lessen and eventually disappear.

Treatment.—This must be conducted upon the same principles that guide us in the management of all chronic diseases.

A. If any long-standing suppuration is present, arising from a diseased bone or joint, it is of primary importance that the local affection should be treated surgically. Where syphilis seems to have been the predisposing cause, you should give

the patient iodide of iron (F. 12), nitric acid (F. 209), sarsaparilla, or other remedies of a similar character.

F. You must try to improve the condition of the blood, an alteration in the chemical or physical constitution of which is supposed to give rise to the lardaceous change. The food should be as nutritious as possible, and a moderate amount of alcohol is usually advisable.

You must first regulate the functions of the stomach and liver, if they appear to be disordered, and subsequently prescribe a prolonged course of tonics. Iron is the best, and may be given alone, or in combination with quinine (F. 201) or strychnine (F. 228). In other cases zinc (F. 233) or manganese should be preferred, the former where there is anæmia and iron disagrees, the latter when an astringent is also required. If scrofula has shown itself, you may prescribe cod-liver oil, lactophosphate of lime and iron, or hypophosphite of sodium. The various salts of potassium have been tried, but hitherto without much success.

Some object to cod-liver oil in these cases, under the idea that its long-continued administration is of itself apt to induce lardaceous degeneration. The tincture of iodine (5 to 15 minims) has been strongly recommended, whilst others have seen most benefit from the use of chloride of ammonium (in doses of 15 to 30 grains).

The excreting organ that usually requires most attention is the intestine. You should not reduce the patient's strength by saline purgatives, but effect your object by means of aloes (F. 155), rhubarb (F. 142), or senna (F. 139). In cases of severe diarrhœa opium may be prescribed, even if there be albuminous urine, as this drug is not so liable to prove dangerous in lardaceous as it is in contracting kidneys. The dropsy attendant on lardaceous liver requires the use of diuretics and diaphoretics, but these should be combined with iron (F. 77) or some other tonic. If any exhausting discharge is present, such as leucorrhœa, or bleeding from piles, you should check it by appropriate means.

Gall-stones.

Prognosis.—Notwithstanding the severe suffering produced by the passage of a gall-stone, the prognosis is usually favorable. Occasionally death occurs from exhaustion, and in still rarer instances peritonitis is set up by ulceration of the distended gall-duct or gall-bladder, or the calculus may become impacted, and incurable jaundice result.

Treatment during the Passage of a Gall-stone (p. 27).

A. In order to encourage the passing of the calculus, it was advised by Dr. Prout that the patient should drink large quantities of warm water, in which bicarbonate of sodium was dissolved in the proportion of one to two drachms to a pint. This seems the most feasible method of increasing the quantity of bile, and, at the same time, diminishing its consistency.

B. It is only in cases of extreme exhaustion that stimulants are required. You must not prescribe them simply because the pulse is weak, for the heart may be temporarily depressed by the nausea. But if the feebleness of the pulse persists, and the patient seems to remain exhausted, you may give ammonia (F. 72), brandy, or ether. Where the stomach rejects medicines, you should order an enema, containing two or three tablespoonfuls of brandy in warm barley water.

C. Your main remedy is opium. This may be given along with ether or chloroform (F. 174), or, what is better, on account of the vomiting, one sixth or one quarter of a grain of morphine may be injected subcutaneously, and repeated every two or three hours until relief is obtained. If, however, you prefer to give opium by the mouth, it is advisable to prescribe it in the shape of a pill ($\frac{1}{8}$ gr. or $\frac{1}{4}$ gr. of morphine) whenever vomiting is persistent. When the patient is at a distance from the practitioner a suppository of morphine may be left, with directions that it should be used in case a severe attack should come on. Where morphine fails, belladonna sometimes proves successful, in doses of a quarter or half a grain of the extract, or ten minims of the tincture, every three hours; or atropine may be used subcutane-

ously, in doses of one eightieth to one sixtieth of a grain. At the same time let your patient be placed in a warm bath for half an hour, to be repeated every three hours, keeping the abdomen covered meanwhile with a large hot poultice or hot fomentations; or a liniment of belladonna and chloroform may be employed sprinkled upon flannels, or on spongio-piline wrung out of hot water. Bladders of ice have been recommended, but hot applications are more soothing.

The inhalation of chloroform or ether is often used in these cases, under the idea that they do not diminish the muscular action of the duct, whilst they afford relief from the pain. It is dangerous to allow a patient liable to attacks of this kind to use chloroform himself, as he may fall asleep over the open bottle.

"A method of administering chloroform in such cases has been suggested by Mr. W. E. Image, of Bury St. Edmunds, which is very convenient, especially when the medical attendant is unable to remain with the patient, and it would be dangerous to entrust the anæsthetic to the friends for administration in the ordinary way. A piece of blotting-paper is folded and placed in the bottom of a tumbler, a little chloroform is dropped upon it by the medical attendant, or by a friend of the patient. The patient then holds the tumbler to the face and inhales. As the edge of the tumbler does not fit closely to the face, there is no danger of the chloroform vapour being inhaled in too concentrated a form. As soon as the anæsthetic begins to take effect, the patient's hand which holds the tumbler falls, and as soon as the anæsthetic begins to pass off, and the pain is again felt, the tumbler is again raised. The only necessary precaution is that the bottle containing the anæsthetic shall on no account be entrusted to the patient himself, as otherwise in his drowsy condition he might spill the chloroform on the pillow or bedclothes, and then, sinking down upon them, might inhale the vapour until a fatal result ensued."*

When the attack is of long duration and there is great tenderness of the gall-bladder, or where severe inflammation of the gall-duct seems to follow the passage of a calculus, leeches may be employed; or, if the pain has persisted for some time,

* Murchison on 'Diseases of the Liver,' p. 405.

repeated blistering will be found of advantage in preventing the thickening that is apt to take place.

The vomiting arises from irritation, and must be combated by ice, hydrocyanic acid, and small doses of morphine. As soon as the pain has subsided, it is advantageous to expedite the expulsion of the calculus by an aperient, such as calomel (F. 165), followed by a saline draught.

To prevent the formation of biliary calculi.—You must order a diet from which, as far as possible, fat, sugar, starch, and alcohol are excluded. Insist upon regular exercise in the open air. Frequent doses of bicarbonate of sodium or potassium are often of great use, but the most effective way of giving alkalies is by means of the waters of Carlsbad, Vichy, Ems, Marienbad, or Homburg abroad, or Cheltenham in this country.

One of the best methods of treatment is to prescribe a long course of phosphate of sodium (ʒij for a dose), to be taken each morning, when fasting, in a tumblerful of hot water, with the use of salicylate of sodium or bicarbonate of sodium with rhubarb (F. 213), for a week or two at a time. An occasional dose of Pil. Hydrarg., followed by a saline aperient, will also prove beneficial. Formerly a combination of ether and turpentine, and latterly the internal administration of chloroform, have been recommended, with the idea that they would dissolve any calculi that might be present in the gall-bladder; but there is no proof that a gall-stone can be liquefied in the living body by the use of any of these drugs.

The gall-bladder occasionally becomes greatly dilated, from obstruction of the ducts by gall-stones, or by inflammation set up by them; and although, in the majority of such cases, the tumour subsides after rest and other medical treatment, in some instances this does not take place. Under such circumstances the gall-bladder has been opened by a surgical operation, the calculi removed, and a drainage-tube introduced.

In some cases of chronic jaundice, which medicines have proved unavailing to relieve, the gall-bladder has been opened and calculi removed from the ducts, thus allowing the free ingress of the bile into the intestinal canal. Before such operations are undertaken it must be remembered that a permanent obstruction of the ducts is more frequently the result of cancer

of the pancreas or other neighbouring structures, than of impacted biliary calculi, and also that these may be present although the obstruction may be due to malignant disease. We would, therefore, advise that the patient or his friends be informed of the possibility of such occurrences before operations of this kind are performed, for we have, on more than one occasion, known great disappointment produced by their fruitless result.

Prevention of Gall-stones.

Amer.—One of the most useful methods of treatment is to give the phosphate of sodium (1 dr. three times a day in hot water). Others advise chloroform (5 mins. three times a day). The chlorate of sodium (5 grs. three times a day) is often used, whilst the inspissated ox-gall is prescribed by others, in combination with the chloride of ammonium. The gall-stones may be affected by faradisation; one electrode is introduced into the rectum, the other, a sponge well moistened, being applied over the gall-bladder.

Fr.—The Durande method consists in giving, each morning, a dose of a mixture of three parts of sulphuric ether mixed with two of turpentine.

CHAPTER XII.

DISEASES OF THE KIDNEYS.

The quantity of urine secreted depends mainly upon the amount of pressure of the blood in the vessels of the glomeruli of the kidney. We consequently give liquids freely when we wish to increase the activity of these organs. Toast-water or barley-water is generally used for this purpose. Distilled water is invaluable in the treatment of diseases of the kidneys, and should be used freely in tubular nephritis, as well as in cases of calculi of the kidney. In the former it is of use by washing away the casts contained in the inflamed tubules, whilst in the latter it takes up uric acid in larger quantity than ordinary spring water. When distilled water cannot be obtained, rain-water, boiled and filtered, may be substituted.

The action of the skin is antagonistic to that of the urinary organs, the greater the amount of blood circulating through the integuments, the smaller being the pressure in the renal arteries. In prescribing diuretics, therefore, this must be borne in mind, and the surface of the body should be kept cool. On the contrary, where you wish to lessen the determination of blood to the kidneys, the use of hot baths is of primary importance.

The activity of the kidneys is also dependent on the amount of the excrementitious materials to be eliminated. As the quantity of urea is increased by animal, and lessened by vegetable food, you might expect that, by a careful management of the diet, you would be able to regulate the renal functions. You are, therefore, advised by some authors to restrict the patient to a diet composed exclusively of farinaceous substances and fruit in all acute affections of the kidneys; but unfortunately this can be seldom continued for any length of time, since in almost every case of congestion or inflammation of these organs albumen is

abstracted from the blood in so large a quantity, that a more nutritious diet becomes necessary.

Warm and vapour baths are employed for the treatment of renal diseases, both to keep up the action of the skin, and also to remove any dropsical effusion that may be present. It is a good plan to let the patient enter the hot bath at about 98° or 100°, and then add more hot water, so as gradually to raise the heat to such a temperature as he can conveniently bear for a quarter of an hour. As soon as he is removed from the bath, let him be packed in hot blankets for one or two hours, so as to encourage the sweating, after which he should be well dried and placed in a warm bed. In the vapour-bath he is surrounded with blankets, and the steam is conveyed beneath them by a pipe connected with a boiler. In the houses of the poor, an easy method of giving a vapour-bath consists in placing the patient on a cane-bottomed chair, and covering him with blankets, which are firmly secured round his neck. A small tub of hot water is placed at his feet, into which a heated brick is dropped from time to time, so as to keep up the evolution of steam. Some employ a hot bath produced by soda-water bottles filled with boiling water, wrapped in flannels, and placed near the patient when in bed; whilst others recommend that a couple of bricks should be put in an oven for half an hour, and then surrounded by thick flannels soaked in vinegar, and supported by plates placed close to the patient's shoulder on one side and his leg on the other.

The most convenient form of hot-air bath for hospital use is that figured below (Fig. 15). The air, heated in the receiver by means of a spirit lamp, is conveyed by a pipe beneath the bed-clothes, which are supported by an iron cradle. With such an apparatus the temperature may be maintained for any length of time you may think desirable.

You should be cautious in the use of hot baths whenever there is congestion or œdema of the lungs. They are also contra-indicated by a high temperature of the skin, and by urgent uræmic symptoms.

You may lessen the activity of the kidneys by medicines that act upon the skin or intestinal canal, and it is with this view that diaphoretics and purgatives are employed in renal disorders.

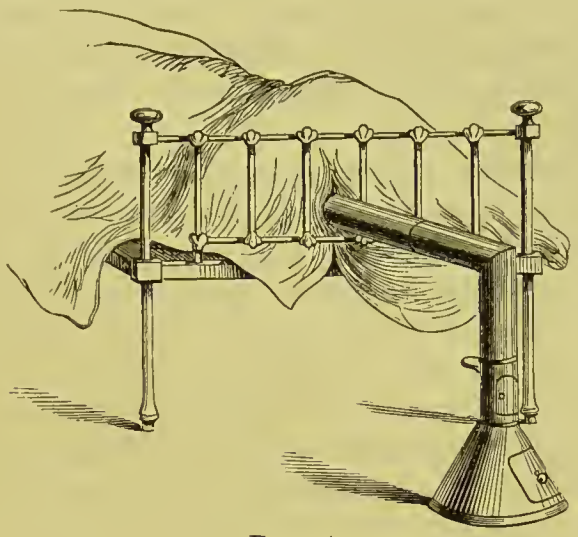


Fig. 15.

You can increase the flow of urine by certain drugs, which are divided, according to their action, into three classes, and are known as hydragogue, refrigerant, and stimulating diuretics.

Hydragogue diuretics are employed to carry off dropsical accumulations. Digitalis, convallaria, strophanthus, squill, scoparium, caffein, and spirit of nitrous ether are included under this head. Digitalis is the most valuable of this class, and on account of its tonic action on the heart, is chiefly employed where dropsy has arisen from dilatation of that organ. But it is also of use in renal diseases, especially in contracting kidney. It may be prescribed in acute renal inflammation, where the diminution of urine is not excessive, but it is less effective when the urine is very scanty, and in cases of chronic tubular disease. Squill is chiefly given where there is deficiency of urine in chronic bronchitis, asthma, and other chest affections, in which its power of promoting expectoration is also of value. Scoparium is often employed, along with squill and digitalis, in the dropsy of heart disease. The spirit of nitrous ether is usually administered along with other diuretics. Caffein is employed in dropsy arising from diseased heart, and may be combined with digitalis or convallaria. We have for many years been in the habit of prescribing liquorice as a diuretic; it is readily taken, especially by children, and may be given to an adult, in doses of half an ounce to one ounce of the

liquid extract in one pint or more of distilled water. It seems to assist the action of the more stimulating diuretics, and often keeps up the flow of urine when, for any reason, it is necessary to discontinue their administration.

The refrigerant diuretics include the various salts of potassium. They are most beneficial where the urine is acid and high-coloured, as well as scanty. They are given in acute tubular nephritis, and whenever there is a deposit of lithic acid.

The stimulating diuretics are juniper, turpentine, cantharides, buchu, pareira, uva ursi, copaiba, and cubebs. None of these should be prescribed when acute inflammation of the kidney or urinary passages is present. Juniper is employed, along with other diuretics, in dropsy arising from disease of the heart or liver. The use of the others is restricted to cases of chronic or subacute inflammation of the pelvis of the kidney, or of the urinary passages.

SECTION I.

Morbid States not necessarily Dependent on any Special Organic Disease of the Kidneys.

Diseases of the kidneys are important, not only on account of their dangerous nature, but because they give rise to other disorders, that often mask the symptoms of the original affection. It is necessary, therefore, whenever you are called to a serious case of any kind, to examine the urine before determining on your line of treatment. In addition to this, the renal secretion often affords a clue to the discovery of diseases, the diagnosis of which would be otherwise doubtful. We need only refer to the presence of leucine and tyrosine in cases of acute atrophy of the liver, and of sugar in diabetes, as illustrations of this. The condition of the urine has also been studied as a guide to the treatment of various kinds of dyspepsia. You cannot, therefore, fail to see the advantage of examining into the state of the kidneys in almost every important case that comes beneath your notice.

It need not be said that the chief use of the kidneys is to eliminate a certain amount of water, as well as of materials derived from the destruction of the tissues that is constantly taking place in the animal frame. When the excretion of the water alone is much diminished dropsy takes place; if the organic constituents of the urine are partially retained in the system, a state is produced to which the name of uræmia has been given, whilst a complete suppression of urine is known as anuria.

Anuria.

This is fortunately a rare condition, but the symptoms connected with it are, at first, by no means so striking as might be expected. The patient may for a day or two make no complaint of pain, his appetite may remain tolerably good, and he may seem as if he had no serious illness. In many cases the anuria is not quite complete, and a little urine is passed at lengthened and irregular intervals, but it is very pale, watery, of low specific gravity, deficient in urea, and occasionally bloody and albuminous. Afterwards the patient becomes restless, is unable to sleep, the tongue is brown and dry, and thirst is complained of. The sleeplessness is more decided as days go on, twitchings of the muscles present themselves, the pupils are contracted, and the breathing becomes slow and laboured. All this time the pulse is not rapid, and the temperature is but little if at all above the normal. The muscular twitchings increase, insomnia persists, slight delirium sets in, the patient becomes stupid and drowsy, and gradually sinks from exhaustion, or may die by coma. There is no urinous odour from the sweat or breath, as in retention of urine. Most of the cases die in from nine to eleven days, but a few are recorded to have recovered, even after complete suppression of urine has persisted for many days.

Anuria mostly arises from an obstruction to the passage of the urine into the bladder, produced by cancerous, hydatid, or other growths compressing the ureters, or from a calculus becoming impacted in the ureter, when the opposite kidney is in a state of atrophy. In some cases the calculus has been found to be extremely small, so that the obstruction must have been partly of a spasmodic character.

In the acute nephritis of scarlatina you also have occasionally complete suppression of urine, but the symptoms of uræmia soon become developed.

Treatment.—Where anuria is produced by cancerous or other tumours of the bladder or uterus compressing the ureters, the only treatment likely to be useful is the removal of the cause of the obstruction. If you have reason to suppose that a calculus in the ureter is preventing the passage of the urine, you must employ warm baths, inhalation of chloroform or ether, and large enemata of warm water. It has been proposed to use shampooing of the loins, and one case is quoted by Sir William Roberts, where free secretion of urine and ultimate recovery followed the use of this measure.

Uræmia.

There is scarcely a structure in the body which may not present morbid changes when death has occurred from uræmia. The serous membranes are frequently inflamed, and pleurisy, pericarditis, and peritonitis are common results. The mucous membranes are equally liable to be attacked, and the bronchial and gastro-intestinal tracts often present the chief morbid appearances discoverable after death.

The symptoms of uræmia necessarily vary according to the organ which is chiefly affected. The more characteristic signs, however, are those furnished by disorders of the nervous system, although these generally produce death without leaving any morbid condition which can be discovered by the anatomist. Thus we see attacks of convulsions or coma, or of both combined. They are usually preceded by headache and drowsiness, but in other cases severe vomiting, or an attack of diarrhœa, may be the earliest symptom. These may for a time disappear, or may usher in coma or convulsions. Sometimes, on the other hand, without any warning, the patient is seized with a fit resembling epilepsy, which may pass off without recurrence, or a succession of attacks may take place, the patient remaining partly or wholly unconscious during the intervals. In some instances cramps of the limbs present themselves, even at an early period of

uræmia; whilst others suffer severely from neuralgic pains affecting different parts of the body.

Prognosis.—Uræmic inflammation of the serous membranes is always of serious import, and recovery is rare when the peritoneum or pericardium is affected. The pain in these cases is often slight, and the temperature not much elevated, but the general depression is more marked than in inflammation arising from other causes. The affections of the brain are attended with imminent danger, but, in prognosis, it is necessary to take into consideration the previous state of the patient's health and the amount and nature of the renal mischief, as well as the gravity of the cerebral symptoms. Thus there is great danger if the patient remains long in a state of coma, as cerebral hæmorrhage is often an accompaniment or result of chronic disease of the kidneys. When uræmic symptoms occur in a person affected with contracted kidneys, in whom the heart is also enlarged, the prospect of recovery is much slighter than in a child suffering from uræmia consequent on a recent attack of scarlatina, where all the other organs of the body are in a normal condition.

Treatment.—When the patient is suffering from the slighter symptoms of uræmia, you should employ purgatives or diuretics to assist in the elimination of the urea; be careful not to check diarrhœa, unless it is excessive. Use hot baths with caution, as they sometimes unduly excite the circulation. Subcutaneous injections of pilocarpine, or an infusion of jaborandi by the mouth, are often recommended in this stage, but you should watch their action, for they are liable to depress if given too frequently or in large doses. When there is a tendency to spasms, bromide of potassium may be prescribed, as it lessens the excitability of the nervous centres.

Formerly venesection was practised in all cases of uræmic coma, and occasionally it is of the greatest use; but it should be remembered that in most chronic cases there is a co-existing condition of anæmia, so that it should not be employed without there is real necessity, and other remedies have proved useless. It is best fitted for plethoric persons who have been attacked with acute affections of the kidney, as, for example, where young and healthy females are suffering from uræmia produced

by acute nephritis occurring during the course of pregnancy. In such cases many recommend, instead of general bloodletting, that cupping should be practised over the loins. When the patient is feeble, and the attack has been sudden and the secretion of urine quickly suppressed, dry cupping over the loins, followed by hot poultices, should be preferred.

In uræmic coma free purgation is most valuable, and should be used whenever bleeding is contra-indicated. The compound jalap powder or sulphate and carbonate of magnesium (F. 148), frequently repeated, are the most valuable aperients; but some recommend elaterium (F. 172), others croton oil.

In uræmic convulsions most authors agree in advising sedatives, so as to lessen the excitability of the nervous centres. Inhalation of chloroform or ether may be employed, but it should not be used when the attacks are preceded by drowsiness, or the patient remains in a state of coma in the intervals of the convulsions. Some prefer bromide of potassium, chloral, or morphine. Chloral may be given in the form of an enema where the patient is unable to swallow. Morphine should be used with great caution when the patient is suffering from contracted kidneys.

Frerichs, who supposed that uræmic symptoms resulted from the decomposition of the urea present in the blood into carbonate of ammonium, advised the internal use of a solution of chlorine, along with enemata of vinegar and water, or other vegetable acids. We have seen great benefit in the uræmic convulsions of children, following scarlatina, produced by the administration of dilute sulphuric acid, in doses of half a drachm, well diluted with water, and repeated every three or four hours; but we have not found this treatment beneficial in uræmia arising from chronic kidney disease.

The neuralgic pains so frequently met with in uræmia are best relieved by tonics. The headache often subsides after the administration of iron, quinine (F. 199), or strychnine (F. 227), assisted by the local application of opium or belladonna. It is not unfrequently relieved by a few doses of antipyrin (10 to 20 grs.) or phenacetine (8 grs.).

The treatment of uræmic inflammation of the serous membranes must be conducted on the same general principles that regulate

the management of a similar condition of these parts arising from other causes. Bloodletting can be very rarely borne, as the patient has been already drained of albuminous constituents of the blood through the kidneys. Mercury is also inadmissible, moderate doses often producing severe ptyalism where the renal functions are imperfectly performed. Opium must be used with great caution, as small doses are apt to produce serious effects. Blisters have in some cases been found to increase the congestion of the kidneys. The chief means at our disposal, therefore, are aperients and sudorifics. Repeated doses of sulphate and carbonate of magnesium (F. 148), the compound jalap powder, or other hydragogue carthartics, are best calculated to afford relief. Where these are inadmissible, hot-air and vapour baths, assisted by the exhibition of acetate of ammonium and small doses of tartar emetic (F. 88), pilocarpine, or other sudorifics, may be employed. The affected part should be covered with fomentations or poultices, and the food should be as digestible as possible.

In chronic cases of kidney disease, where vomiting is only occasional, the nitro-hydrochloric (F. 210) or phosphoric acid (F. 211), in a bitter infusion, generally answers best, because the secretions of the stomach are often alkaline, from the presence of carbonate of ammonium, produced by the decomposition of urea. Where other means have failed to relieve the vomiting we have prescribed with advantage the washing out of the stomach, every second or third day, by means of the stomach-tube.

Bronchitic and pulmonary inflammations must be combated by measures directed according to general principles. Occasionally, œdema of the glottis occurs in kidney disease; this should be treated with hot applications externally, the use of morsels of ice slowly swallowed, and, if the symptoms are urgent, by laryngotomy.

Dropsy.

The treatment of dropsy, arising from an imperfect elimination by the kidneys, is of great importance. The opinions of practitioners differ, some recommending that the superfluous fluid

should be removed by exciting the skin and intestines to increased action, whilst others urge the necessity of washing out the renal tubes by diuretics, so as to clear them of the epithelium collected in them.

In chronic cases you will usually find that diuretics are only useful when tubular nephritis has taken place in a contracting or lardaceous kidney, a large proportion of the tubes being in such cases unaffected. The more acute the case, the less can we trust to the action of diuretics, more especially when life is threatened by a collection of fluid in the lungs or serous sacs. Their use is chiefly indicated where there is a tendency to diarrhœa, and you are in consequence afraid to prescribe the stronger purgatives. In some chronic cases diuretics are ineffectual until the vascular system has been depleted by puncturing the œdematous limbs, or by tapping the peritoneum or pleura. As regards the kind of diuretics, digitalis is most generally useful, especially when there is a tendency to diarrhœa. Along with it you may give the acetate, citrate, or iodide of potassium or decoction of broom (F. 90). You must bear in mind that digitalis is only of value so long as dropsy is present; it generally ceases to act upon the kidneys as soon as the superfluous fluid has been removed. Where vomiting is produced by digitalis taken internally, you may apply a hot infusion of the leaves, four times the strength of the infusion of the Pharmacopœia, to the loins with spongio-piline. Some practitioners have found benefit from the resin of copaiba (F. 98), but, according to our experience, it is a very uncertain remedy, and often takes away the appetite of the patient. In chronic cases of renal dropsy, squill, tincture of cantharides, and juniper have been employed, but they are seldom of much value, and they sometimes seem to irritate and thereby increase the amount of albumen in the urine. Rayer recommended the infusion of horseradish, and Dr. Harley the succus belladonnæ.

Diaphoretic medicines are of use in renal dropsy, chiefly by assisting the action of more active remedies. You should not trust to them alone when life is threatened by an accumulation of fluid in the serous sacs or in the lungs. In some cases diuretics, which had before failed, act copiously as soon as a free action of the skin has been established. The most useful

diaphoretics are the hot-air and vapour baths, but in bad cases you should order the heated air to be conveyed into the bed, so as to avoid the necessity of disturbing the patient. In acute cases you may employ acetate of ammonium (F. 85) or citrate of potassium, or, if the pulse is good, jaborandi or pilocarpine. In some cases of renal dropsy, where the œdematous limbs were hard and brawny, and other remedies had signally failed, we have seen the subcutaneous injection of pilocarpine, twice a day, succeed admirably in removing the effusion, but in all such cases you should carefully watch its effects upon the heart, and, if necessary, give stimulants. Some advise the compound ipecacuanha powder, but in most chronic cases of renal disease you must prescribe opium with caution.

Whenever there is great and sudden congestion of the kidneys, manifested by a scanty secretion of urine loaded with albumen or where life is threatened by a copious effusion into the large serous sacs, or into the pulmonary tissue, you should have recourse to hydragogue cathartics. The acid tartrate of potassium is one of the best of these, in the form of the compound jalap powder, or three drachms may be combined with fifteen or twenty grains of jalap; or you may have recourse to saline aperients, such as the sulphate and carbonate of magnesium (F. 148), the sulphate of sodium (150), or some mineral water. Dr. Christison recommended five to seven grains of gamboge mixed with half a drachm of cream of tartar. If these fail you may use elaterium, either in a single dose of one quarter of a grain or one sixth of a grain, every three hours (F. 172). During a long-continued course of cathartics, you must be careful to support the strength of your patient by nutritious diet, and, if necessary, by alcohol.

Where you fail to remove a sufficient quantity of fluid, and the symptoms are urgent, you may find it necessary to have recourse to operative procedures. You ought never to do this without urgent reason, as the cellular tissue and the serous sacs are very prone to inflame in dropsy arising from chronic disease of the kidneys. Where the removal of the fluid by operation is absolutely necessary, puncturing the skin of the legs may be performed with a needle, and the limbs should be afterwards covered with flannels wrung out of hot water. Some advise

you to smear the skin with carbolised oil whilst the fluid is in process of draining away ; others prefer that one or two incisions, about three quarters of an inch long, should be made in the swollen limbs, which should afterwards be wrapped in hot moist flannels. Southey's tubes are useful, and are less liable to set up inflammation than either punctures or incisions ; it is generally sufficient to maintain them in their position for five or six hours.

Even if the secretion of urine is sufficient in quantity, œdema may be maintained by a watery state of the blood, and, under such circumstances, you must prescribe iron, quinine, and other tonics, together with a generous diet and a moderate allowance of alcoholic stimulants. The perchloride of iron, or the dialysed iron, generally answers best in these cases.

Anæmia.

In all cases of diseased kidneys you may expect, sooner or later, to encounter anæmia. This arises partly from the drain of albumen, partly from the derangement of the digestion that so generally accompanies these complaints. Various remedies have been proposed to diminish the loss of albumen. Tannin, gallic acid, and alum have been given internally, but no great advantage has followed their use. Some patients seem to improve under the use of phosphate of manganese, which probably acts as an astringent. Whenever anæmia is a prominent symptom, you will derive advantage from iron. The perchloride is the best preparation, and may be combined with acetate of ammonium (F. 205) or some other diaphoretic. If you wish to employ iron along with a diuretic, you may give the tincture of the acetate along with acetate of potassium, or you may prescribe tartrate of iron along with acid tartrate of potassium. Some object to the use of iron when there is much co-existing hypertrophy of the heart, and recommend the sulphate of zinc (F. 232), in doses varying from one to five grains.

The three chief conditions upon which you must keep your eye fixed in the treatment of chronic kidney disease are uræmia, dropsy, and anæmia. According as the one or the other seems most threatening, you should direct your measures for its relief,

no matter what other indications may be present, or what other treatment you may have to adopt.

Hæmaturia.

Blood may present itself in the urine in various general disorders of the system, as well as from affections of the kidneys and urinary passages. Thus it may occur in scurvy, jaundice, and in any of the infectious fevers, and under such circumstances it does not require medical treatment, apart from that of the disorder of which it is a symptom. In inflammatory conditions of the kidney, in which it is also frequently present, the amount of blood in the urine is usually small, and demands no special attention.

There is a form of hæmaturia which occurs only occasionally, and is named "paroxysmal hæmoglobinuria," the urine in the intervals of the attacks being perfectly normal. It presents itself chiefly amongst males, some of whom are of a rheumatic constitution, many of them having previously suffered from malaria. The attack is generally ushered in after exposure to cold or wet, by chilliness or rigors, and is attended with pain in the loins or extremities, weariness, vomiting, and in some cases with an elevation of temperature. The urine is brownish black in colour and albuminous, but presents under the microscope few or no red corpuscles. The attacks may recur from time to time, but the disease almost always yields to medical treatment.

In the early stage it is advisable to act briskly on the bowels with a dose of calomel or blue pill, followed by a saline aperient. Acetate of lead, alum, and gallic acid have been used to ward off the attacks, but quinine and acids are a more effectual means of preventing them. Arsenic has been prescribed successfully, and, where the above remedies fail, a course of iron and quinine (F. 201), or of one of the mineral acids, will usually be found to answer.

Severe hæmorrhage often occurs in cancerous and tubercular affections of the kidney, and also in calculus. In every case remember that cancerous or other tumours of the bladder are the most frequent cause of severe hæmaturia, and that these can be

most readily diagnosed by means of the cystoscope. The employment of this instrument has, indeed, revolutionised our ideas respecting hæmaturia, and has made a matter of certainty what was formerly one only of inference. Not only can a tumour be readily detected in the bladder, but, where the disease is situated in the kidney, the flow of blood can be often seen to proceed from the ureter of the affected side.*

Treatment (p. 24).—**B.** In severe hæmorrhage you may apply an ice-bag to the loins, but this is rarely required. More generally it is sufficient to prescribe gallic acid (F. 45), alum (F. 50), or perchloride of iron (F. 200); acetate of lead is much less efficacious. You may combine ergot with the gallic acid, or may inject ergotine subcutaneously. Port wine is one of the most useful astringents.

D. The patient must be kept at rest. If the bleeding is excessive, let him remain in bed; if less severe, it will be sufficient that he should avoid all undue exertion.

Chyluria.

The urine occasionally presents a milky appearance, with or without an admixture of blood, and, when shaken with ether, is proved to contain fatty matters; whilst it affords evidence also of the presence of albumen when subjected to the ordinary tests for that substance. The disease is usually attended with loss of flesh and strength, and deterioration of the general health. It occurs endemically in certain hot climates, but occasionally shows itself in persons who have never lived out of this country. It was formerly attributed to some disorder of nutrition, but more recent inquiries have shown that, in most instances, a communication has been formed between the lymphatic system and some part of the urinary passages. In tropical cases, the blood and urine have been discovered by the microscope to contain the embryos of an entozoon (*Filaria sanguinis-hominis*), the mature worm being situated in one of the lymphatic trunks. Hitherto treatment has proved unavailing to remove the disease, but in some

* 'The Electrical Illumination of the Bladder and Urethra,' by E. Hurry Fenwick.

cases the chyluria only shows itself at intervals, and without much injury to the general health.

Treatment.—Various remedies have been recommended, such as iron, quinine, and other tonics. Gallic acid seems to have been employed by some with advantage, whilst others have found it quite useless. Dr. Bunyan has prescribed the decoction of mangrove bark with success, in one-ounce doses four times a day. Benzoate of sodium is sometimes of service.

SECTION II.

Acute Diseases of the Kidneys.

Acute Nephritis.

This disease, when uncomplicated, is most generally met with in children as a consequence of scarlatina. It usually occurs within three weeks of the disappearance of the rash, so that the urine should always be carefully examined during this period, although no symptoms may be present. In adults its most common cause is exposure to wet or cold, and dropsy presents itself very rapidly. Acute nephritis also takes place in those who are suffering from chronic kidney disease. A person liable to gout, or who has been affected with albuminuria, will often be attacked with acute nephritis from time to time, each attack not only being dangerous in itself, but increasing the original mischief, and hurrying on the case to a fatal termination. Acute inflammation of the renal tubes, along with chronic changes in the connective tissue of the kidneys, is one of the most common conditions for which patients of middle or advanced age are admitted into the wards.

Prognosis.—Frerichs reckoned the recoveries from acute uncomplicated tubular nephritis at two thirds of the whole number attacked; but if we include all those who have albuminous urine after scarlatina, the proportion of cures is very much larger. Recovery is more rapid and complete in the young

than in those of middle age. The danger is generally in proportion to the diminution in the amount of urine, and Dr. West states that a suppression of urine beyond twelve hours in children is always fatal. Whenever the urine is very scanty and loaded with blood and renal epithelium, you should look upon the case as a serious one. If pneumonia, or œdema of the lungs or the glottis occurs, the chances of recovery are but slight; pericarditis is almost always fatal. So long as albumen can be detected in the urine, even though no dropsy is present, your prognosis must be cautious.

Treatment (p. 16).—**B**. Venesection was formerly recommended in order to remove the renal congestion. In most cases of scarlatinal nephritis, the patient is already anæmic before serious symptoms show themselves, so that venesection would be injurious. When the attack has been sudden, the diminution of urine very great, and the patient young and plethoric, you may with benefit draw blood, either from the arm, or, what is better, from the loins, by cupping; but such cases are seldom met with, and the patient's attention is usually first attracted by the occurrence of dropsy attended by weakness. In severe cases, where the person is feeble, dry cupping to the loins is often of great service, and should be frequently repeated. In all cases keep the back covered with a large linseed, or linseed and mustard poultice.

When the more acute symptoms have subsided, and albumen still persists in the urine, you will find it useful to prescribe iron, quinine, or other tonics. The iron is best given in the form of the tincture of the perchloride, in very small doses at first, and may, if a diuretic be thought advisable, be combined with digitalis (F. 77); or, if the bowels are inclined to constipation, it may be given along with a saline aperient. Dr. Ringer states that "if on the immediate subsidence of the acute inflammation, one to three minim doses of tincture of cantharides be given every three hours, the blood will almost always quickly disappear, whilst the albumen decreases more gradually, and the urine becomes more abundant."

Stimulating liniments rubbed over the loins are of use during the later stages of the disease; they may contain croton oil or capsicum; cantharides and turpentine had better be avoided,

as their application often increases the quantity of albumen in the urine.

C. You do not require sedatives, excepting in cases of uræmic convulsions. In children suffering from convulsions, dilute sulphuric acid, in frequent doses, is often more useful than either chloroform or bromide of potassium.

D. In every case of acute tubular nephritis, no matter whether it be uncomplicated or combined with chronic renal disease, you should insist on perfect rest. Confine the patient to bed, so as to maintain the action of the skin; let the room be kept at an even temperature, and carefully protect him from draughts of cold air. He should be watched until the albumen and casts disappear from the urine, as slight exposures to cold often cause a relapse of the disease. You may give physiological rest to the kidneys by stimulating the skin and intestinal canal to increased excretion. In dangerous cases you should rely on cathartics, and may prescribe sulphate and carbonate of magnesium (F. 148), or the compound powder of jalap, or in extreme cases elaterium (F. 172). When the symptoms are less threatening, the use of hot baths or vapour-baths will be sufficient. These ought not, however, to be employed if the temperature of the skin is high, or urgent symptoms of uræmia are present. The action of the baths may be assisted by sudorifics, such as small doses of tartar emetic and acetate of ammonium (F. 88), or of citrate of potassium. This last salt is very valuable, as it alkalinises the urine, and thus probably assists in the expulsion of the epithelium from the urinary tubes. Large doses of the acid tartrate of potassium (one drachm and a half three times a day for an adult) is a favourite medicine with some practitioners, but the citrate of potassium seems to us preferable. Dr. Dickinson advises the free use of distilled water; it may be given along with the liquid extract of liquorice if the urine contains blood.

E. Milk is the best kind of food, and may be given freely. After a few days, beef tea, or mutton or chicken broth may be added. Unless there be some special reason requiring it, alcohol had better be avoided.

B. *Amer.*—When the urine is very scanty, dry cupping to the loins and hot poultices should be used. As the patient improves, iron and

other tonics may be given. When iron is prescribed, inhalations of oxygen should be also employed (Dr. Delafield).

Fr.—Bloodletting should be practised ; usually cupping over the loins will be found sufficient.

Germ.—Cupping or leeches to the loins are only required when there is much pain.

C. *Amer.*—Restlessness should be relieved by bromide of potassium, chloral hydrate, or morphia.

D. *Amer.*—If dropsy is a marked feature, hot-water or hot-air baths should be prescribed, and pilocarpine (¼ gr.) may be injected subcutaneously.

Fr.—Rest in bed and light diet are sufficient for slight cases.

Germ.—Hot baths should be prescribed, and their effects assisted by a dose of Dover's powder, or of Liq. Ammonii Acetatis, taken shortly before them. After the bath use a wet pack. Pilocarpine may be given, but the baths alone are preferable. The bowels should be acted on by senna, decoction of colocynth, or gamboge (2 grs.).

E. *Germ.*—The diet should consist of milk, buttermilk, or milk gruel. Let the patient especially avoid tea, coffee, and alcohol.

Pyelo-nephritis.

In most cases, suppuration of the kidney is accompanied by inflammation of the mucous membrane of the pelvis of the kidney, or is the result of pyæmia. Occasionally it follows an injury to the loins.

Prognosis.—When the suppuration of the kidney is a sequela of cystitis the symptoms are often very obscure. Under such circumstances, it usually terminates fatally in two to three weeks. Where it results from pyæmia, the prognosis depends upon the severity of the original malady rather than on the renal affection. There is a more favorable prospect in cases following an injury, because although the whole of one kidney may be destroyed by inflammation, the other is often able to compensate for its loss by increased activity. Such cases are necessarily very dangerous, but they not unfrequently end in complete recovery.

Treatment (p. 16).—**A.** We can only derive advantage from attending to the cause when the renal inflammation results from cystitis. Here surgical treatment is everything, and the duty

of the physician is to attend to the strength of the patient, and to support it by quinine, mineral acids (F. 210), alcohol, and appropriate food.

B. You can employ local treatment when the inflammation results from an injury. If the patient be young and robust, and the fever high, you may cup or leech him over the loins, and in all cases you should apply hot fomentations and poultices; at the same time the tension of the circulation may be lessened by the administration of saline aperients.

As soon as suppuration seems to be fully established, and pus appears in the urine, you should support the strength of the patient by quinine, acids (F. 218), wine, and a nutritious diet.

C. You rarely require sedatives when the disease has arisen from cystitis, since the accompanying typhoid condition lessens the sensibility of the patient. In suppuration resulting from accidents you should administer morphine subcutaneously or by the mouth, or other sedatives in case opium seems to be contra-indicated.

D. Whenever you suspect renal suppuration, you must insist on the patient remaining in bed. In order to give physiological rest, stimulants and an excessive quantity of liquids should be forbidden.

G. Occasionally the pus finds an exit through the loins, or into one of the neighbouring organs. When it approaches the surface, a free and early opening should be made.

Acute Pyelitis.

Prognosis.—This disease may arise from stricture, cystitis, or inflammation of some other part of the urinary passages. Under such circumstances the prospect is more or less grave, according to the probability of relieving the original cause of the mischief. Where it is produced by the irritation of a calculus, the prognosis chiefly depends upon the likelihood of its escape from the kidney, and upon the amount of inflammation it may excite. In tubercular pyelitis the prospect is gloomy, since it is rare for the kidney to be the only organ implicated, and death generally results from phthisis.

Treatment of acute pyelitis (p. 16).—**A.** Where it arises from cystitis or stricture, the first and most important point is to afford relief to the original malady. The stricture of the urethra should be dilated, and the cystitis carefully treated in the ordinary way. When a calculus in the kidney is the exciting cause, you should endeavour to ascertain its composition by repeated and careful examinations of the urine. If you have reason to believe the stone to consist of uric acid or oxalate of lime, you must neutralise the urine by means of alkaline bicarbonates (F. 16), citrate of potassium, or acetate of potassium or lithium (F. 24). If, on the contrary, you suspect it to be composed of phosphates, you should prescribe mineral acids and tonics (F. 210, 218).

B. Where the pain of the back is severe and accompanied by much tenderness, and the patient is otherwise healthy, you may give great relief by cupping or leeching the loins. In feeble subjects use dry cupping or sinapisms. In either case let the back be covered with a large hot linseed poultice, frequently changed, or let the loins be often fomented with hot water or some sedative lotion.

C. When there is severe pain it will be necessary to use sedatives. You may inject morphine subcutaneously, or, what is better, prescribe the compound ipecacuanha powder, or some other sedative that has a tendency to act upon the skin.

D. Give rest, by insisting that the patient should lie on a bed or couch and avoid all exertion. You should relieve, as far as possible, the affected organs by keeping up a gentle action on the bowels by means of some mild aperient, such as Carlsbad or Friedrichshall water, or the confection of senna (F. 139).

E. The diet should consist of liquids, such as milk, beef tea, barley water, or farinaceous food.

SECTION III.

Chronic Diseases of the Kidney.

Chronic Bright's Disease.

As all the varieties of this disease give rise to similar effects upon the constitution, and are attended with great danger to life, it will be convenient to consider them together.

Prognosis.—This is unfavorable in all the forms of chronic Bright's disease, as we know of no method by which an organ whose structure is gravely altered can be restored to its normal condition. The prospect, however, differs according to the nature of the malady. It is unfavorable in proportion to the duration of the complaint, and the effect it has had in lessening the vital powers of the patient. Danger is always imminent as soon as well-marked symptoms of uræmia show themselves, and is in proportion to their steady increase in spite of medical treatment.

Inflammation of the serous membranes is fraught with great danger. Pericarditis is almost always fatal; peritonitis usually ends badly; and pleurisy, although often recovered from, is a much more serious disease than where it occurs in individuals whose kidneys are healthy. Hæmorrhages into the retinæ are of evil omen, as they show that the blood-vessels are unable to bear the strain of the hypertrophied heart. Persons thus affected often perish from an attack of apoplexy. Hæmorrhage from any of the mucous membranes must be regarded with serious apprehension, especially where it affects more than one organ. Dropsy is always dangerous when it occurs to any considerable extent, or when it affects any of the serous sacs. In contracted kidney, œdema of the face and extremities frequently disappears for a time, but is apt to recur at intervals. Simple hypertrophy of the heart does not add to the risk of the patient, and may be looked upon as a conservative affection; but when the valves are thickened or functionally imperfect, the disorder of the circulation tends to produce a more speedy

termination of the case. Vomiting occurs in all forms of chronic kidney disease, and its ill effects vary according as it is a symptom of gastritis, or arises merely from an alkaline state of the gastric secretion. Severe and obstinate diarrhœa is rare, excepting as a consequence of lardaceous degeneration; but when it occurs in this form of the disease it is of evil omen, on account of the probability that the gastro-intestinal tract is also implicated. Dryness of the skin is, in like manner, an unfavorable sign, as it shows that an important eliminating organ is incapable of assisting the kidneys.

In chronic tubular disease, the prognosis is favorable in proportion as the attack can be traced to a definite exposure to cold or to an eruptive fever. It is also favorable when the amount of dropsy is slight, and the quantity of albumen in the urine is small. Where only a little albumen remains after the dropsy has disappeared, the patient may recover, even after several months' illness; but the prospect becomes more gloomy every week that dropsy and highly albuminous urine persist in spite of treatment. Most of these cases end fatally within six months, and it is very uncommon to find life protracted above two years, even when the symptoms are less pronounced. In contracting kidney the patient may live, with an imperfect state of health, for years; but any indiscretion in diet, or exposure to wet or cold, may give rise to an attack of acute tubular nephritis. The duration of lardaceous kidney is longer than that of tubular disease, and less than that of contracting kidney. A few instances have been recorded where life was prolonged for eight or ten years, but, as a general rule, death takes place in two or three years at the latest.

Treatment of Chronic Bright's Disease (p. 30).

A. In lardaceous kidney surgical interference at an early period may remove the source whence the change in the blood has arisen, and thus prevent the extension of the disease. When the renal disorder has resulted from malaria a course of quinine is necessary. Where there is a history of phthisis or scrofula, the syrup of the iodide or the perchloride of iron, with cod-liver oil, will prove of value; some prefer arsenic along with iron. The iodide of potassium or the bichloride of mercury should be em-

ployed in syphilitic cases, or, if there is much anæmia, the iodide of iron or the chloride of gold and sodium may be prescribed.

F. Diet is of great importance in every form of the complaint. In cases of gouty kidney the amount of animal food must be restricted, and vegetables and fruits should be substituted. Niemeyer recommended a milk diet, and stated that he had seen excellent results from it. Anyone observing the cases of chronic kidney disease in a London hospital would draw the conclusion that an excessive use of alcohol was one of the chief causes of the disease. Although this may be doubted, it is always wise, whenever there are grounds for suspecting that a patient is in the habit of indulging too freely in fermented liquors, to forbid them entirely, or to restrict him to a moderate amount. Where alcohol is necessary, either on account of weakness of the heart or a feeble state of the digestion, the form in which it should be given must be determined by the nature of the case. In lardaceous disease, if the quantity of urine is sufficient, malt liquors may be given; in contracting kidney the patient should be restricted to a small quantity of spirit well diluted; where anæmia is the prominent symptom, port wine, sherry, or Burgundy will be found most useful; in other cases, a light claret or hock may be prescribed.

The tendency to anæmia in all chronic cases of kidney disease must be borne in mind, and an occasional course of iron should be prescribed. Any of the preparations of this metal may be used, but the tincture of the perchloride (F. 197), the syrup of the phosphate, or the citrate of iron and quinine (F. 199) are chiefly recommended for this purpose.

The bowels must be carefully regulated, but, unless dropsy or uræmia is present, you had better not depress your patient's strength by severe purgatives. The condition of the skin must be watched. The patient should be clothed in flannel, and use the Turkish or vapour bath occasionally, to secure the free action of the sudoriparous glands. In mild cases the weekly use of a warm bath will be found sufficient.

Wherever the patient is able to bear it, and there are no threatening symptoms, a change of climate may be recommended. In tropical countries renal diseases are comparatively rare, and a sea voyage to a warm climate is often of the utmost value.

Any exhausting discharge, such as bleeding from piles or leucorrhœa, should be arrested by appropriate treatment.

When dropsy occurs the patient must be kept in bed, and the treatment should be directed to the removal of the œdema. Hot baths and the administration of jaborandi are generally believed to be of less service than in acute cases, but we have known the subcutaneous injection of pilocarpine extremely useful. Where the urine becomes smoky, dry cupping to the loins, followed by poultices or hot fomentations, may be prescribed; at the same time the patient must be confined to bed and restricted to a liquid diet. The cannabis indica has been strongly recommended under these circumstances.

In the bronchitis to which persons suffering from chronic Bright's disease are so liable, all severe measures, such as bloodletting and mercury, are inadmissible, and every means must be employed to support the strength of the patient whilst you combat the local malady. Dyspeptic symptoms usually require the use of alkalies, along with hydrocyanic acid and a light bitter infusion (F. 206), together with careful attention to the bowels. A slight amount of diarrhœa should not be checked, but if it become excessive, bismuth (F. 25), chalk, or acetate of lead (F. 60) may be given. Remember that in chronic kidney disease opium must be used with great caution, as small doses often prove dangerous. This is more especially the case in contracted kidney, for in the lardaceous form it may be used more freely.

H. If the renal disease be associated with dilatation of the heart, or any other cause likely to produce venous congestion, you must direct your treatment to improve the state of the circulation. It used to be the practice to keep up counter-irritation over the loins by means of setons, moxas, or blisters. The setons and moxas have long been laid aside as injurious, and it is found that the amount of albumen in the urine is often increased by the use of blisters. Some authors advise that croton oil should be rubbed on the back, others the employment of stimulating liniments.

Astringent medicines were formerly prescribed, under the idea that they would diminish or prevent the loss of albumen, and so prevent anæmia. Alum, gallic acid, and nitric acid were used, but experience has shown that they are incapable of

lessening the drain upon the vascular system, whilst they are apt to prove injurious to the digestive functions. In some chronic cases where there was an excessive loss of albumen we have, however, seen improvement follow the use of the phosphate of manganese, given along with iron.

F. *Fr.*—The patient should be restricted to an exclusively milk diet. The milk should be taken cold, and the quantity should not be less than three litres in the day. After improvement has resulted from this diet, tannin, ergot, or perchloride of iron with nux vomica may be given. No benefit results from the use of iodide of potassium, chloride of sodium, or fuchsine.

Germ.—The patient should, as much as possible, be restricted to milk diet. The iodide of potassium, or, in case of anæmia, the iodide of iron is worthy of a trial.

H. *Amer.*—When there is co-existing disease of the heart small doses of opium, iodide of potassium, digitalis, or convallaria may be given. If the urine is very scanty, digitalis, perchloride of mercury, iodide or acetate of potassium, or jaborandi may be prescribed. Often milk, or milk and water (½ oz. to 1 oz. every half-hour), acts well as a diuretic. In uræmic attacks, small doses of opium, chloral hydrate, digitalis, or convallaria may be prescribed. In dropsy it may be necessary to tap the pleura or peritoneum, or puncture the œdematous limbs.

Chronic Pyelitis and Pyonephrosis.

Prognosis.—When only one kidney is affected the patient may live for many years, and he is often in better health when the discharge of pus is copious. In rare cases, perfect recovery has ensued after the gradual inspissation of the pus and the absorption of the diseased structures.

Treatment (p. 30).—F. You must carefully regulate the diet; in most cases the food should be nutritious as well as easy of digestion. On account of the long-continued suppuration, tonics, such as quinine (F. 215) and perchloride of iron (F. 200), are almost always required.

G. In pyonephrosis, where there is a well-marked tumour, it is necessary to cut down upon it and insert a drainage-tube. If there is reason to believe that a calculus is present, an attempt

should be made to remove it. Wherever perinephritic suppuration occurs, a free and early opening is necessary.

H. As in all other cases of inflammation of the mucous surface, you must watch the character of the secretion. When the urine contains much mucus you can generally do good by prescribing buchu, uva ursi, or pareira brava. Where the discharge is copious and purulent, astringents are valuable, such as gallic acid (F. 45), perchloride of iron (F. 200), or acetate of lead (F. 60). In the more chronic cases you may employ copaiba, cubebs, turpentine, or the oil of sandal-wood with advantage.

In some cases of chronic pyelitis dependent on calculi the use of turpentine is beneficial, the pain being relieved and the urine becoming less purulent. It is best given in the form of capsules, one or two being taken night and morning. The oil of sandal-wood is especially fitted for such cases, and may be administered in capsules containing ten or twenty minims.

Hydronephrosis.

Prognosis.—In case the enlargement is confined to one side the patient may recover, or he may experience no ill effects beyond the discomfort arising from the bulk of the tumour. If, however, the action of the opposite kidney is interfered with serious consequences must necessarily result, because the organ that has hitherto performed all the excretion is suddenly arrested in its action.

Treatment.—When the disease is unilateral, and has been preceded by the symptoms of calculus, shampooing over the kidney has been recommended. In other cases tapping has been performed, but generally with an unsuccessful result. Where it is thought advisable to operate, a fine trocar should be entered from behind, so as to avoid wounding the peritoneum. When the tumour is on the left side, the puncture should be made just in front of the last intercostal space; on the right side Mr. Morris recommends it should be done at a spot "halfway between the last rib and the crest of the ilium, between two inches and two inches and a half behind the

anterior superior spine of the ilium." In some cases the mass has been successfully removed by abdominal incision.

Cancer of the Kidney.

Prognosis.—As in all other malignant affections, we can only look for a fatal termination. The duration of the disease, however, varies greatly. In children life seldom lasts more than six or seven months after the first symptoms have shown themselves, but in adults the complaint may go on for two or three years. It might be expected, from the rapidity with which cancer of the liver or stomach destroys the patient, that malignant disease of the kidney would be equally rapid; but as one kidney is, as a rule, alone diseased, the other, by increased functional activity, tends to compensate for the loss of that which is affected.

Treatment.—**F.** You must attempt to maintain the strength of your patient by a nutritious diet and a moderate amount of alcohol. When the appetite begins to fail, you may prescribe acids along with quinine, or some bitter infusion; or if there is anæmia give iron (F. 197), combined with an acid on account of the tendency to hæmorrhage. Regulate the bowels by gentle laxatives, but carefully avoid all severe aperients, such as saline medicines, as they tend to lessen the already diminished contents of the vascular system.

The chief symptoms you have to treat are pain and hæmorrhage.

Pain is not so common in cancer of the kidney as in malignant affections of other organs, but if it is severe, you may give morphine, either by the mouth or subcutaneously; in other cases chloral (F. 108), with or without morphine, is more useful. Remember that in this, as in all other cases of cancer, the pain is apt to assume a neuralgic character, and that it is often more relieved by steel, quinine, and other tonics than by sedatives. Kidneys affected with cancer have been successfully removed by operation, but in most cases the disease has returned in other organs.

Renal Calculi.

Prognosis.—It is almost impossible to lay down rules for prognosis in these cases. In one person, a large stone may remain in the kidney for years without producing any irritation, whilst in another a much smaller concretion may set up fatal pyelitis. The younger the patient and the more healthy his constitution, the greater the chance of recovery; in old or feeble persons the danger to life is always great.

Treatment for the Prevention of Renal Calculi.

A. Although it is doubtful if we possess any medicine capable of dissolving renal calculi, there is no question that we can often prevent their formation. Ascertain if the urine is habitually acid or alkaline; if acid, the calculus is probably composed of lithic acid or oxalate of lime, and the chemical examination of any stone that may have been previously passed will help to settle the question. If the urine is acid you may prescribe alkalies, such as the liquor potassæ (F. 20), taking care that it is well diluted and taken between meals; or the alkaline bicarbonates (F. 16), or the citrate or acetate of potassium, may be employed. The citrate is perhaps the best preparation, as it is the least apt to irritate the digestive organs. Given in a tumblerful of distilled water, in doses of thirty to sixty grains night and morning, it seldom fails to neutralise the acidity of the urine. The solvent effect of alkalies ceases as soon as the urine becomes ammoniacal; it is therefore advisable to test it from time to time, and if this condition is developed, the medicine should be discontinued. Where the urine is alkaline you may prescribe nitric (F. 209) or nitro-hydrochloric acid in some bitter infusion; or, if the nutrition is much impaired, you may order perchloride of iron or the syrup of phosphate of iron.

F. The diet must be carefully regulated. As a general rule, an excess of acid requires a spare diet and the exclusion of alcoholic liquors; whilst, when the urine is alkaline, a more liberal and varied dietary and some form of stimulant are indicated.

Carefully regulate the bowels by the use of a mild aperient pill (F. 155) where the urine is alkaline, but when lithic acid is passed in undue quantities a dose of phosphate of sodium, or some other saline aperient, given each morning, well diluted with water, will prove more beneficial.

Where the pain has been very severe, and has proved rebellious to medical treatment, the affected kidney has been cut down upon, and the calculi contained in it have been successfully removed. Of course all ordinary treatment ought to be tried before such a measure is undertaken.

The passage of a renal calculus is usually attended with severe suffering.

Treatment during the Passage of a Calculus (p. 27).

A. If the urine be very acid an alkaline liquid, such as a solution of the citrate or bicarbonate of sodium or potassium, may be given. Probably the chief benefit derived from alkaline liquids is the increase in the quantity of fluid excreted. In all cases empty the bowels as soon as possible by an enema of warm water, with or without castor oil, as an overloaded state of the colon often proves an impediment to the passage of a small calculus down the ureter.

B. You seldom have occasion to excite or depress the vascular system. If there is great feebleness of the heart you may give small doses of brandy, but this should not be administered as a matter of course.

C. Your chief remedies are sedatives. Inject morphine subcutaneously, and repeat it every two or three hours if the pain persists, or you may give opium by the mouth. Sometimes the subcutaneous use of atropine succeeds when morphine fails. If the pain is not relieved by these, or is very severe, you may use chloroform or ether by inhalation, but, as a general rule, morphine is more certain to afford permanent relief. Along with morphine you should employ a warm bath or a warm hip-bath for half an hour at a time, and afterwards cover the part, to which the pain is chiefly referred, with a large hot linseed-meal poultice, or you may use fomentations of hot water. Drachm doses of the oil of turpentine often appear to aid the descent of the stone, and consequently to curtail the duration of the colic.

CHAPTER XIII.

DISEASES OF THE BRAIN.

It is frequently necessary to subdue mental excitement, both in cerebral diseases and where the brain is secondarily affected. As all muscular motion is attended with an expenditure of nervous force, you should insist upon perfect rest in the recumbent position in acute affections of this organ. In cases of delirium avoid, as far as possible, forcible restraint, but where a padded room is not available, and you have not sufficient attendants to prevent the patient from injuring himself or others, you must have recourse to the "strait waistcoat." If there be any objection to the use of this, leather gauntlets may be applied to the wrists and ankles and secured to the bed, or a sheet may be stretched across the trunk and arms and firmly tied to the bedstead. Nurses are often in the habit of attempting to argue the patient out of his delusions. This should be forbidden, and perfect silence, or acquiescence in his ideas should be enjoined. Unnecessary conversation in the sick room must be avoided, as a person in delirium readily catches up and dwells upon words uttered by those about him.

All excitement through the senses ought to be guarded against, as the eye and ear are generally in a state of painful activity. The room must be darkened, and any light that may be necessary should be shaded. Remove curtains from the bed, as they obstruct free ventilation. The quietest room in the house must be selected, and it should be as far as possible from the noises of the streets. Movements of furniture should be forbidden, and the attendants enjoined to use slippers and walk as quietly as possible.

The application of cold to the head is very useful in subduing cerebral excitement. In slight cases it will be sufficient to

cover the forehead and head with a cloth wet with ice-cold water; but where the symptoms are more severe, the hair should be cut or shaved, and a bladder or india-rubber bag filled with pieces of pounded ice kept constantly upon the scalp. It is a good plan to suspend the bag by a piece of string, so that it may rest against the head without its weight being felt by the patient. A "Leiter's coil" is a still more convenient method of applying cold, as the bedclothes are not liable to be wetted by its use.

There are various drugs which are believed to act upon the nervous system. 1. Stimulants. 2. Excito-motors. 3. Sedatives. 4. Nervine tonics. 5. Those that lessen the sensibility of the nervous system, and so relieve pain.

The chief stimulants of the nervous system are the same as those we have already found to excite the heart, viz. alcohol, ammonia, and ether. Alcohol is the most valuable of them, and requires the same cautions and rules for its administration as when it is employed to increase the action of the vascular system.

The excito-motors are stimulants to the spinal cord, but they have other properties, chiefly of a tonic character. Nux vomica is the most useful, and may be prescribed in the form of tincture or extract; but its active principle, strychnine, is generally preferred. Formerly it was employed in all kinds of paralysis, but it is now confined to cases where there is a depressed state of the nervous system. It should not be given if there are symptoms of an inflammatory nature, and it is useless in organic diseases of the brain or spinal cord. It is valuable in some forms of dyspepsia, and is a useful stimulant in chronic constipation; it is also a good tonic in dilated heart, when iron is inadmissible. Strychnine may be used subcutaneously, in doses of one eightieth to one thirtieth of a grain, in cases of paralysis. Ergot and belladonna are considered by some as excito-motors, but their value as such is doubtful.

Sedatives include the salts of bromine as well as chloral, belladonna, lobelia, conium, Calabar bean, nitrite of amyl, &c. Of these, the bromide of potassium is the most valuable. It is employed whenever there is much cerebral excitement unattended by inflammation. When it has to be continued for a

length of time, as in epilepsy, it is useful to combine it with cinchona or some other tonic, as it is apt to produce mental weakness, failure of memory, depression of spirits, general feebleness, and an eruption on the skin, when taken to excess. Chloral calms down nervous excitement, but it depresses the heart, and consequently is not so generally useful as the bromide of potassium. It is prescribed to procure sleep, where the restlessness arises from anxiety or mental excitement; but it must be used with caution if the heart is feeble or dilated. Conium is occasionally employed in sleeplessness arising from over-excitement; it is chiefly prescribed as a sedative in pulmonary affections when opium is inadmissible. Hyoscyamus is given for the same purposes as conium; it is one of the best sedatives in the case of children, and may be usefully combined with bromide of potassium. Belladonna acts as a general sedative, but is chiefly valuable in relieving muscular spasm; when given in an overdose it produces delirium and dilatation of the pupils, and these symptoms, it must be remembered, may arise even from the external application of the drug. A convenient way of using it is by the subcutaneous injection of the one hundredth to a sixtieth of a grain of the sulphate of atropine. Lobelia and stramonium, although sedatives, are seldom prescribed excepting in cases of bronchial spasm.

All tonics probably improve the state of the nervous system, when it is enfeebled by disease, by their action on the digestive organs. Certain drugs, however, are regarded as more especially nervine tonics, such as cinchona, strychnine, arsenic, zinc, silver, copper, phosphorus, and cod-liver oil.

Arsenic exerts a striking influence over some nervous affections, but in order to produce beneficial effects it is often necessary to increase the dose at regular intervals until certain symptoms are produced. These are irritation of the conjunctivæ, whiteness of the tongue, nausea, vomiting, and diarrhœa. The best preparation is the liquor arsenicalis. The sulphate and valerianate are the most valuable preparations of zinc, and may be employed whenever iron seems to be indicated but does not agree. The nitrate of silver is rarely prescribed excepting in some chronic affections of the spinal cord; it should not be continued longer than two months at a time, lest the skin

become discoloured. The sulphate of copper was formerly much used as a nervine tonic, but is now seldom employed. Phosphorus may be given in chronic cases, either in the form of the hypophosphite of sodium, or dissolved in oil, or as a pill. Cod-liver oil is invaluable as a tonic in all chronic nervous disorders, and may be combined with any of the foregoing drugs. It is not necessary to give large doses, one or two drachms being usually sufficient.

Any of the sedatives may be employed to procure sleep or relieve pain, but none is equal to opium for these purposes. It should be prescribed with caution for children, as they are very susceptible to it; for persons suffering from chronic disease of the kidneys, in whom a small dose is often followed by dangerous symptoms; in congestion of the lungs, and in bronchitis where there is excessive secretion along with a feeble power of expectoration. When decided effects are required, it is best to use opium in the form of tincture, or the subcutaneous injection of morphine. In the latter case do not begin with large doses, one eighth of a grain being sufficient at first.

Hyoscine is a valuable sedative in cases of maniacal delirium, and may be given by hypodermic injection in doses of $\frac{1}{240}$ gr. to $\frac{1}{80}$ gr.

Subcutaneous injection is one of the best methods of employing sedatives, as the drug is by this means at once introduced into the circulatory system. A small syringe, to which a fine perforated needle is affixed, is employed for this purpose. The skin of the arm or leg is pinched up, and the point of the instrument introduced until the subcutaneous cellular tissue is reached; the piston is then pushed down so as to expel the fluid, and the needle is withdrawn. Different forms of syringe have been invented. In one the piston is moved with a screw, so regulated that each turn corresponds to a measured quantity of the liquid; in another it is prevented by a stop from expelling more than the desired quantity. These contrivances are unnecessary for any person who is willing to exercise ordinary care.

CHAPTER XIV.

ELECTRICITY IN THE TREATMENT OF NERVOUS DISEASE.

By H. Lewis Jones, M.D.

The use of electricity in medical treatment is not nearly so universal as it deserves,—partly, no doubt, because the management of the apparatus is sometimes troublesome and the treatment itself rather tedious; and partly because medical men are not as a rule sufficiently familiarised with the indications for its employment, and with the modes of carrying it out.

These difficulties can be overcome without much trouble, and once overcome, electricity proves itself to be a most valuable addition to our therapeutic resources, especially in the treatment of various forms of paralysis.

Hitherto electrical treatment has been left far too much to the tender mercies of the so-called "medical electrician," and it has suffered in consequence. Now, however, the study of electricity in its applications to medical practice is receiving more attention at the hands of medical men themselves; and it is to be hoped that before long the unqualified medical electricians may disappear entirely, and electrical treatment acquire a more satisfactory status in consequence.

In this chapter an attempt will be made to explain as simply as possible the management of electrical apparatus, and the ordinary methods of treatment, and to enumerate some of the more important morbid conditions in which electricity has proved to be of value.

The uses of electricity in medical practice fall naturally into several divisions, as follows:

1. For the diagnosis and treatment of nervous diseases, and for the treatment of various other morbid states.

2. For the destruction of tissue by electrolysis, as in the treatment of nævi, moles, and other cutaneous growths, and for the removal of superfluous hairs; electrolysis has also been used in the treatment of uterine fibroids, of stricture of the urethra, and in aneurism.

3. In the form of electric light for diagnostic purposes with the aid of apparatus such as the cystoscope, the endoscope, &c.; and to light up dark cavities of the body as an aid in surgical operations.

4. In the form of the galvano-cautery.

The first of these divisions of the subject belongs mainly to medical practice, and will receive most consideration in this chapter; the other three divisions are more specially surgical.

SECTION I.

Electrical Apparatus.

A vast amount of ingenuity has been expended upon the construction of electrical apparatus, as can be seen from the instrument makers' catalogues. In some of these more than a thousand separate articles are enumerated. These things are for the most part superfluous, and serve only to perplex the purchaser.

The apparatus which is really necessary for general medical purposes is the following:—1. A battery of twenty or twenty-five cells, with a current collector for switching them into and out of circuit gradually. 2. A galvanometer, graduated in milliampères. 3. An induction coil, with means for regulating it. 4. A commutator, for breaking, making, and reversing the direction of the current. 5. Cords and electrodes for conveying the current to the patient.

All the above apparatus arranged in a portable form in one box can be had from the instrument makers* under the name of a combined battery (Fig. 16).

* Mr. K. Schall, 55, Wigmore Street, W., for all kinds of electro-medical

Such an apparatus has the great advantage that it can be used both in the consulting room and at patients' houses. If desired

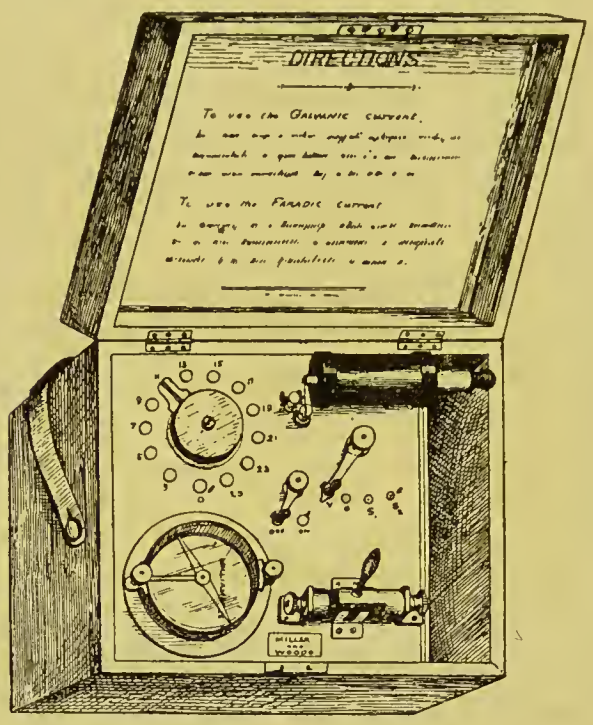


Fig. 16.—Combined Battery.

a fixed electrical cabinet may be set up in the consulting room, but this is not necessary, nor is it a good plan to multiply apparatus which tends to deteriorate. The cells used for the portable battery are small-sized Leclanché cells, or dry cells. Of these latter there are now many different makes; the type made by Siemens Bros. and Co., and known as the "Hellesen" cell, can be thoroughly recommended.

A combined battery of the kind described will last for a year or even for two years without skilled attention, and at the end of that time the cells can be renewed at a moderate cost. It is important to remember that the battery must always be put out of action by turning off the switch before it is put away. If

apparatus; Messrs. Coxeter and Son, Grafton Street, Gower Street, W.C., ditto; Messrs. Miller and Woods, 2, Gray's Inn Road, Holborn, W.C., a good combined battery at £8 8*s*., also medical apparatus for utilising electric light currents.

this is neglected the cells can be run down in a very few hours, and spoiled.

Twenty-four cells is a sufficient number for all ordinary purposes, and any further number adds to the weight and cost of the battery without any proportionate advantages.

The Dial Collector (Fig. 17) is an important part of a good medical battery. It is one of the rules of electrical treatment

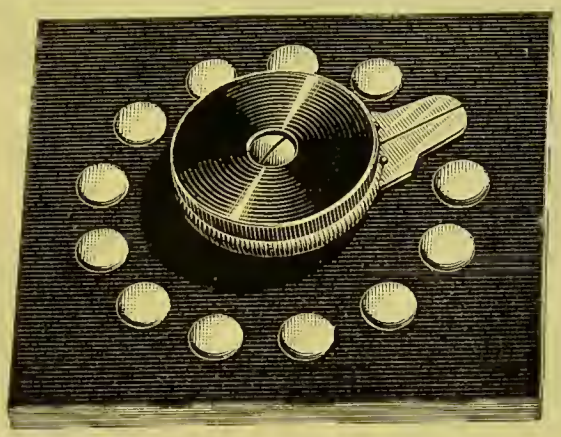


Fig. 17.—Dial Collector.

that all accidental and unnecessary shocks must be entirely avoided; except in certain special conditions the current must never be suddenly raised or lowered during the treatment of a case, and the current collector provides for this by affording a means of varying the current in a gradual manner.

It consists of a metal pointer moving round a centre, and making contacts with metallic studs numbered 1, 2, 3, 4, 5, &c.; these are joined to the cells of the battery in such a way that the figure indicates the number of cells brought into circuit by the touch of the pointer; thus when it rests on stud No. 6, six cells are in circuit. The pointer must be just broad enough to reach two studs at once, in order that there may be no break of circuit as it is passing between any two of them; the current can then be increased or decreased step by step without producing sudden shocks. Care must be taken never to leave the pointer at rest in contact with two studs at once, because when it is in that position one of the battery cells is in short circuit, and its energy is being ruinously wasted. This short circuiting is prevented in the collector figured above, and devised by Messrs.

Miller and Woods (Fig. 17). There are several forms of dial collector; the single collector is enough for all purposes, though the double collector has certain points of advantage, as it permits of the use of any of the cells, and makes it easy to test them individually (Fig. 18).



Fig. 18.—Double Collector.

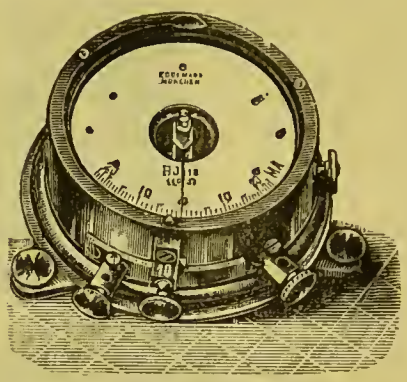


Fig. 19.—Galvanometer.

The Galvanometer (Fig. 19).—This is indispensable, for without it the important question of dosage cannot be more than guessed at. The plan of estimating the strength of current from the number of cells in circuit is quite untrustworthy, because the current passing is determined almost entirely by the resistance of the patient's skin, which varies within very wide limits: thus five cells might give too much current with one patient, and fifteen might be insufficient for the next. With a galvanometer graduated in *milliampères* the current in circuit can readily be measured. Several good forms of medical galvanometer are made by the instrument makers—one which reads from 1 up to 20 or 30 milliampères will answer for most purposes. If provided with a "shunt," such an instrument will read up to 200 or 300 milliampères, and will suffice for all purposes of medical treatment.

The Commutator or reverser is an arrangement for reversing the direction of the current in the external circuit; one should always be fitted in a medical battery, because in the electrical examination of paralysed muscles it is very necessary to have

an easy method of making, breaking, and reversing the current.

The Induction Coil.—This is the apparatus used for obtaining the interrupted currents which are so much used in diagnosis and in treatment. The coil is fitted with an automatic vibrator like that of an electric bell, and the movements of the vibrator produce the interruptions in the "primary" or battery circuit of the coil. The secondary circuit is composed of an independent wire coiled in many turns over the primary coil, and currents are "induced" in it by the interruption or make and break of the current in the primary; these secondary currents flow in alternate directions, and therefore cannot be measured by a galvanometer: the rate at which they succeed one another is determined by the rate at which the interruptor vibrates. As the current in the primary circuit is large, it would soon exhaust the small cells of a medical battery. The induction coil in a combined battery is therefore excited by one or two separate cells of larger size, and these can be renewed when necessary. It is wise not to allow the coil to work except just when it is being used, and the interruptor must, if necessary, be started with the finger when the coil is switched on, as the expenditure of current is much less when the interruptor is vibrating than when it is at rest.

A current induced in the primary itself and called the primary current is sometimes provided for in medical coils, but the secondary currents are quite sufficient for all purposes; their strength is graduated in one of the following ways, viz. by sliding the secondary coil to or away from the influence of the primary, or by sliding a metallic tube or shield in or out between the primary and secondary coils, or between the coils and the iron core of the instrument, or by winding the secondary coil in two or more sections, which can be successively thrown into the circuit by means of a switch, or by including in the circuit an adjustable resistance. The physiological effect of induction coil currents varies somewhat for different arrangements of the winding, and for different rates of the contact breaker. Generally it may be stated that for the relief of painful conditions a secondary coil of many turns and a rapid vibrator are the best, while for stimulation of muscles and for

general purposes of treatment a slower vibration of about 50 per second, and a short secondary coil are to be preferred. As the induction coil is very frequently used for treatment, it may be convenient to keep one for the purpose in a separate case. Numerous forms can be found in the instrument makers' catalogues, at prices from 30*s.* to £5 5*s.*

The conducting cords are made of flexible stranded wire, silk covered; they should be four feet long and of different colours, as this makes it more easy to trace their attachments to the battery. It is advisable to have some simple form of terminal soldered to their ends, and the covering should be wound round at the ends with a few turns of silk thread, and varnished; this will prevent it from becoming frayed out and untidy.

The Electrodes.—Two forms of electrode are needed. One, an oval plate of flexible metal covered with wash-leather, flannel, or

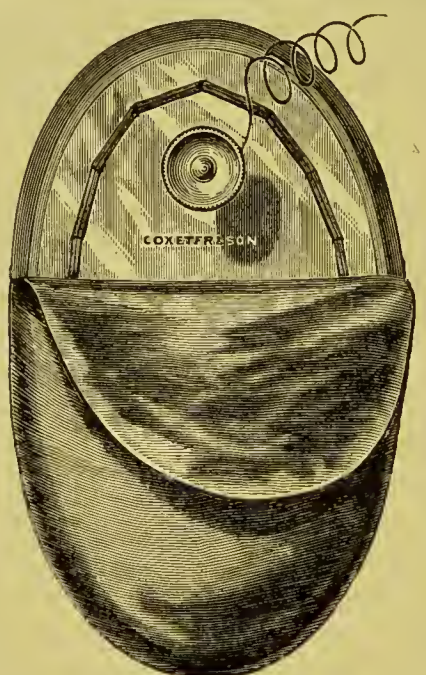


Fig. 20.—Plate Electrode.

amadou, measuring about two inches by four (Fig. 20). This is the "indifferent" electrode, and its shape is convenient for application to the nape of the neck, to the front of the chest, or to the buttock; while the other, or "active" electrode is manipulated over the affected part. The active electrode is a disc of

metal covered with wash-leather; it is screwed into a wooden handle for convenience of application (Fig. 21). Three inter-



Fig. 21.—Handle for Electrode.

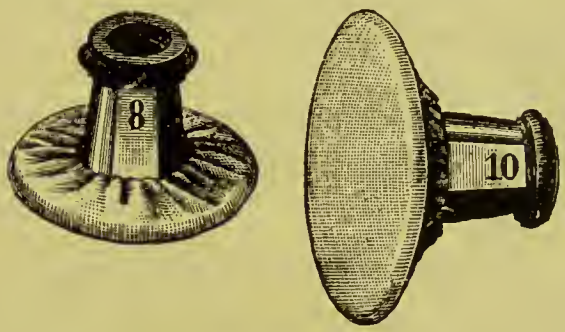


Fig. 22.—Electrodes.

changeable metal ends, of sizes varying between half an inch and two inches in diameter, will be sufficient. Binding screws are fixed to both the electrodes for the connection of the wires. The indifferent electrode is to be placed in a sheath, water-proof on one side to protect the patient's clothes from wet. The elec-

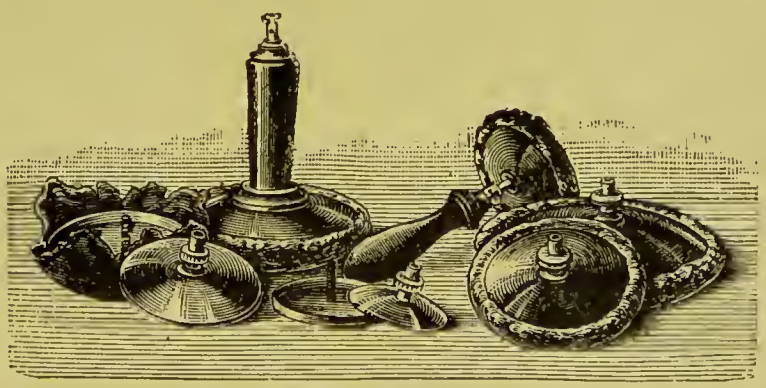


Fig. 23.—Electrodes.

trodes figured (Fig. 23) are very convenient, as they allow of changing the wash-leather covering in a simple and rapid way. There are two discs of metal, an upper and a lower, and the wash-leather is nipped tightly at its edge between these when they

are screwed together. A new piece of leather can be put on in a moment, without any help from needle and thread.

A large number of special electrodes have been devised for particular purposes, but it is not necessary to consider them at present, except to say that it is convenient to be provided with one having a key in its handle, by which the circuit can be closed and opened at will. For use in testing muscles, the form with a closing key is better than one with an opening key (Fig. 24).

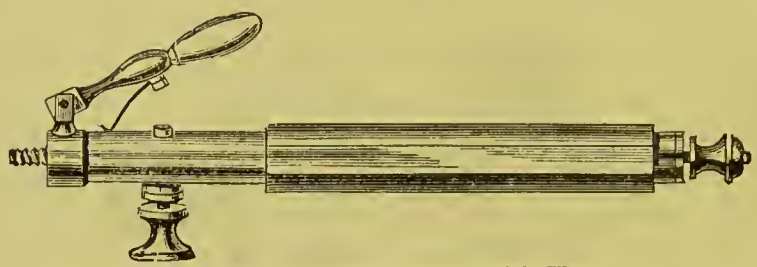


Fig. 24.—Testing Handle, with Key.

This arrangement permits the electrode to be kept still in one position while the circuit is made and broken; it simplifies the testing, and allows the electrode to be held with even pressure upon the spot tested. If the circuit is closed and opened by moving the electrode errors may creep in.

The Uses of a Battery.—Such a battery as has been described will be useful in the treatment of hemiplegia, infantile paralysis, facial paralysis, lead palsy, neuritis and pressure palsy, and many other similar conditions; also in sciatica, neuralgia, in spasmodic or hysterical conditions, and in some forms of muscular rheumatism.

The first questions to be considered before commencing electrical treatment are as follows:—What effects may be expected? When should the continuous current be used, and when the interrupted? Which pole must be applied to the affected part? How long should the sittings and the duration of treatment be continued?

The effects which are produced by electrical treatment may be arranged as follows:

1. Stimulating and tonic. This includes the trophic and vasomotor effects which can be observed.
2. Electrotonic.
3. Electrolytic.

The first may be produced both by the continuous and the interrupted currents; the others belong to the continuous current alone.

The choice of the continuous or the interrupted current depends in part upon the effects desired. For stimulation alone, the interrupted current is the best generally; but in certain paralytic conditions the muscles no longer respond to the induction coil, and then the battery current should be used instead. Duchenne preferred to use the interrupted current for almost all paralytic conditions, but since his day the continuous current has come more into favour, while now again at the present time the most recent investigations seem to point to the interrupted current as the one most widely useful. With the alternate currents of an induction coil the choice of poles is unimportant, but with continuous currents it is necessary to choose the pole in accordance with the effects desired: thus the electrotonic state set up round the anode or positive pole is sedative, and therefore the use of the anode is indicated in painful or irritable states, in neuralgia and so forth; while the stimulating effects of kathelectrotonus indicate the superiority of the kathode or negative pole for paralytic or atonic conditions. When electrolytic effects are desired, as in the surgical treatment of nævi and strictures by electricity, the different effects at the poles must be carefully considered; at the anode acids are liberated and at the kathode alkalies, and the coagulating effect of the acids at the anode may be very undesirable,—for instance, in the electrolysis of a stricture of the urethra the kathode should always be the pole introduced. Neglect of this precaution has led to an adhesion of the positive pole to the stricture, producing laceration of the urethra on its forcible withdrawal.

The results of electrical treatment are not often so rapid in development as one might be inclined to expect; treatment should be practised two or three times a week, and each sitting should be of ten minutes' duration. Distinct improvement in suitable cases may be looked for within three or four weeks; but in certain states, notably in infantile paralysis, the progress is slow, and treatment will often be necessary for three, six, or nine months if satisfactory results are to be gained.

The Utilisation of Electric Lighting Currents.

With the steady advance of electric lighting both in London and country towns, the application of electric lighting currents to medical and surgical purposes is coming more and more into notice.* Already many medical men use the current from the mains in the treatment of their patients; and more would do so were it not for a wide-spread belief that there is some risk of accidents occurring, though with properly chosen apparatus and with ordinary care there is no danger.

The current supplied by the companies is in some cases an alternating current, and in others a continuous one; either of these can be used to light surgical lamps or to heat cauteries, but the former will not serve for a source of continuous current, and the latter will not supply an alternating current except through the medium of an ordinary induction coil.† The pressure at which it enters houses is usually 100 volts, and, as this is too high for medical purposes, some device must be employed before the current can be applied to a patient. When the supply is an alternating one, it is very easy by means of a transformer to reduce the voltage to any required degree, and then there is no difficulty. A Woakes's or similar transformer (Fig. 25) enables the operator to obtain the most delicate graduation of the voltage, and it is perfectly safe and easy to handle; and when properly wound it will heat cauteries, light small surgical lamps, or yield an "induction" current for the testing or treatment of paralysed muscles. It will not yield a steady current like that of a battery.

In Woakes's transformer there are three pairs of terminals, one for the attachment of cautery apparatus, one for incandescent surgical lamps, and one for direct application to patients;

* Electric lighting stations are now in operation in fifty towns in the United Kingdom, and in progress in many more.

† In London, the St. James's and Pall Mall, Westminster, Notting Hill, Kensington and Knightsbridge, Chelsea, Charing Cross and Strand, and St. Pancras Companies supply a continuous current; the Metropolitan, the City of London, and House to House Companies supply an alternating current.

the instrument is not graduated in volts, but the proper strength is obtained by experiment in each case by sliding up the moveable bobbin over the fixed bobbin; this increases the strength

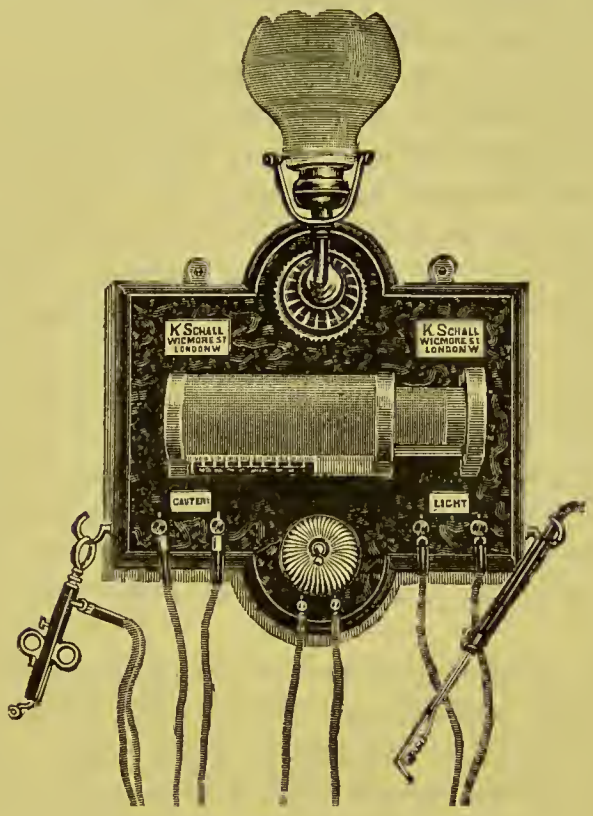


FIG. 25.—Woakes' Transformer.

gradually. The lamp shown in the figure serves as a safety resistance, and also as an indicator that the transformer is in action. It should not be left thus except while it is in use, lest it become overheated, and the insulation of the coils be damaged.

The customary pressure for cauteries is 4 volts, that proper for the electric bath is 6 to 8, and for applying "induction currents" to patients is 10 to 20. With the alternating supply the use of a properly graduated transformer* to lower the voltage is in every way better than to use the full pressure of the mains and to choke down the current by means of resistances. On

* A very good medical transformer is made by Messrs. Miller and Woods, of 2, Gray's Inn Road, and is figured in the 'Electrician' for September 29th, 1893.

the continuous current systems it is a complicated and expensive matter to reduce the voltage by transforming contrivances, for which purpose a combined motor and dynamo running on one shafting are needed; resistances are therefore more often employed for the purpose of reducing the magnitude of the current.

For application of the 100-volt continuous current to patients an adjustable resistance of one hundred thousand ohms must be had. Especial care must be taken to moisten the skin thoroughly when current from the mains is used, and the resistance must be very gradually withdrawn from the circuit as the treatment proceeds. When the total resistance in rheostat and patient together are equal to 20,000 ohms, five milliampères of current will be flowing in the circuit. A better way of utilising the continuous current supply is to charge accumulators with it in the first place, and then to take out current from the accumulators as required. This plan has the great advantage that, the accumulators being portable, the operator is not tied down to one spot as he is by a fixed installation, but can carry his charged accumulators to his patient where his patient cannot come to him.

Although accumulators are most unsatisfactory when they are not properly attended to, this is the fault, not of the accumulator itself, but of its treatment. Under proper conditions of recharging a secondary cell behaves very well, though it soon spoils if left uncharged for three or six months at a stretch; such treatment as that will ruin any accumulator.

By means of accumulators the continuous 100-volt electric lighting current can be made available for medical purposes at a smaller outlay, and with fewer complications than by any arrangement of resistances. The Lithanode Company* make excellent cells which weigh less than 8 oz. apiece, and indeed they have cells weighing as little as 2½ oz. each, which are perfectly suited for galvanisation of patients, for electrolysis, or for the testing of muscle and nerve, and so on. These can be fitted into an ordinary medical battery box in the place of primary battery cells, and recharged from the mains when required. Everyone who has a continuous current electric lighting supply available

* The Lithanode and General Electric Company, Limited, 64, Millbank Street, Westminster, S.W.

can keep these cells in first-rate order with no more complicated apparatus than a switch, an incandescent lamp, and a pair of connecting cords, and the larger accumulator cells needed for the cautery or for surgical lamps can be kept charged as easily. All that is required is to connect the cells with the electric light supply for an hour or two now and then with a 16 or 32-candle power lamp in the circuit to regulate the rate of charging. For a complete outfit a general practitioner should have three batteries, one of 15 or 20 small cells arranged in a medical battery box, with current collector and galvanometer and induction coil; one 2-cell accumulator for his cautery, capable of discharging at a rate of 20 ampères, and one of 4 or 5 cells capable of discharging 1 ampère, for his cystoscope or other electric lamps. For this last purpose nothing is better than the small portable sets which can be bought ready made for use as travelling or bedroom reading lamps; they weigh only 4 or 5 lbs., and are easily modified to take the conducting wires belonging to all surgical incandescent lamp instruments. On the alternating supply circuits these secondary batteries are of no use, as the mains cannot be used to recharge them.

The dangers to be feared in the use of electric light currents for patients are those arising from carelessness on the part of the operator, such as connecting up to the wrong terminals, forgetting to put in proper resistances, and the like. The fear of sudden and unexpected rise of pressure in the mains need not be considered, as it is practically impossible for such a thing to happen under the existing Board of Trade rules. With an 8-candle lamp permanently fixed in the circuit, the current passing through cannot exceed 350 milliampères, even without counting the body resistance; and if the body resistance be taken at the very low estimate of 1150 ohms, the maximum works out at 150 milliampères, which, though sufficient to produce extremely uncomfortable shocks, is too little to be dangerous, for it appears from experiments upon animals that probably half an ampère (500 milliampères) at least is required to kill. If the adjustable resistance of 100,000 ohms is permanently fixed in the circuit so that it cannot be switched out, and if it be so arranged that it cannot be reduced to a lower value than 10,000 ohms, the patient will be safe enough.

SECTION II.

Physiological Effects of the Electric Current.

Electrical currents act as a stimulus to living organisms, and when applied in a proper manner and at a suitable strength they tend to promote the activity of the tissues. This effect is very evident in such tissues as nerve and muscle; but it is not confined to these, but affects all living cells. The effects, moreover, are more distinct when the currents are varying or interrupted than when they are continuous and steady, so that it appears as though the physiological effects depended more upon the rate of change of the electrical currents than upon their actual strength. Thus a weak battery current which is not felt when flowing steadily will produce sensation and muscular contraction at the moments of make and break, and its strength must be considerably increased before the steady flow begins to produce perceptible effects. Experiments have recently been made on the action of electricity upon the metabolism of the tissues; these show that the passage through the body of electrical currents increases the elimination of urea and of carbonic acid gas considerably. This result is many times more manifest with alternating or interrupted currents than it is with steady currents, and it is a direct effect, and not one brought about indirectly as a result of the muscular contractions; for even when the currents do not produce any muscular contraction, the signs of increased metabolic activity are still present. These results are valuable, because they afford an experimental proof of those general tonic and stimulating effects of electrical treatment which have long been recognised clinically.

The beneficial action of electrical treatment in disease is very largely due to this stimulating effect, and one may regard electricity as acting very much in the manner in which massage acts, but with the advantage that it can be so directed and applied as to reach any required part in the body, and the electrical stimulation is more thorough and complete than any which can be produced by the passive movements of massage.

Besides the general stimulating effects of electrical currents, local stimulating or sedative effects can be produced by the setting up of electrotonus in any portion of the body. The sedative action requires the application of the positive pole or anode, and the current must be carefully and slowly raised up to a proper strength, and at the conclusion of the sitting must be as carefully diminished. An adjustable resistance (or rheostat) interposed in the circuit enables the current to be raised and lowered in a satisfactory way. The figure (Fig. 26) shows a convenient and cheap form of rheostat for the purpose. It should have a resistance of several thousand ohms.

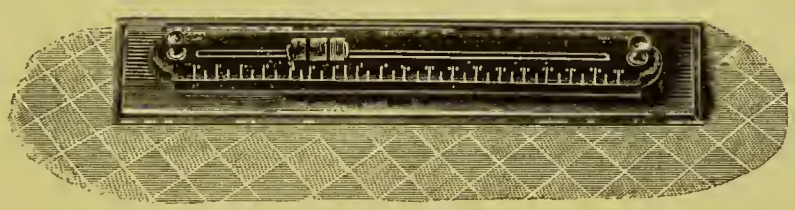


Fig. 26.—Adjustable Carbon Rheostat.

The Resistance of the Body.—By the formula known as Ohm's law we can calculate the current which a given electromotive force can set up in a conductor whose resistance is known, or, conversely, the resistance of a conductor can be calculated if the electromotive force of the battery is known, and the current flowing in the conductor be measured by a galvanometer. Electromotive force is measured in volts, resistance in ohms, and current in ampères. Thus one volt will drive a current of one ampère through a resistance of one ohm, and a current of a thousandth of an ampère (one milliampère) through a resistance of a thousand ohms, and six volts will drive six milliampères through a resistance of one thousand ohms.

As each Leclanché cell has an electromotive force of 1·5 volts, four cells arranged in series, as in a medical battery, represent an electromotive force of six volts. If the collector be turned on to four cells, and the electrodes be applied dry to the surface of the dry skin, the galvanometer in the circuit will give no deflection. If the electrodes are well soaked in warm water and again applied as before, the reading of the galvanometer will be about one milliampère, showing that the resistance has

been lessened by the moistening of the skin, and the reading of the galvanometer will increase gradually minute by minute if the electrodes be maintained in contact with the skin, until eventually it may reach two or three milliampères. The resistance is in this last case 2000 ohms; the current will probably not go above this figure. The skin in contact with the electrodes gradually becomes more moist and more vascular, and a pricking sensation is felt. If litmus paper be placed on the skin it will be reddened at the point where the positive pole was placed, and will be turned blue at the point corresponding to the negative pole. The experiment shows that the resistance of the body amounts to many thousand ohms when the skin and the electrodes are dry, and that it is much lower when the skin is moist. It shows also that the passage of the current causes increased vascularity of the skin and a gradual decrease of the resistance down to about 2000 ohms under the conditions of medical treatment. If very large electrodes are used the resistance becomes lower still, and if one electrode be placed in the mouth it again becomes less; while if the skin be removed in a recently dead body, and the electrodes be applied directly to the subjacent tissues, the resistance will come down as low as 300, or even 200 ohms.

The resistance of the body, then, depends almost wholly upon the thickness and state of moisture of the skin. It is decreased by using electrodes which have a large conducting surface, and it diminishes during the first few minutes of the passage of the current. For practical purposes of treatment it may be estimated at about 2000 ohms, or at 3000 or 4000 ohms if the palm of the hand or the sole of the foot is the site of one electrode.

Electrolytic Effects.—The reddening of the skin is largely caused by the chemical bodies liberated at the surface of the electrodes. These electrolytic effects are not to be forgotten, because vesication, or even sloughing of the skin may be caused with applications which are too strong or too prolonged. The electrolytic action of the current is much more marked when bare metal electrodes are placed in direct contact with the skin; therefore electrodes covered with a layer of moist sponge or flannel or wash-leather must always be used if electrolytic effects are to be avoided. With small-sized electrodes there is con-

centration of the chemical products of electrolysis upon a small area; so, to prevent injury to the skin, large currents should be applied through the medium of large electrodes. In this way the density of current per unit of area is kept low. M. Boudet de Pâris has constructed an elaborate table of areas of electrode suitable for currents of different magnitudes, and his results may be roughly stated to be about two milliampères per square inch as an appropriate current density. The production of injurious electrolytic effects need only be considered when the continuous current is being used and when the electrodes are kept fixed in one position—"stabile" method. When, as in ordinary treatment, the fixed "indifferent" electrode is large, and the active electrode is kept moving over the surface of the skin ("labile" method), there is no fear of injury to the skin from the products of electrolysis.

With the alternating currents of the induction coil there is no electrolysis, nevertheless the use of bare metal electrodes is not advisable unless painful stimulation of the skin is to be produced. In that case an electrode of fine metallic wires ("the faradic brush") can be used.

Phenomena of Nerve and Muscle.—The induction coil current when sufficiently strong produces a tetanic contraction in any muscle to which it is applied, and the contraction lasts as long as the current is passing. Continuous battery currents may also produce a similar state of tonic contraction, but only when they are of considerable strength. With the strength of battery current usually employed in treatment, a single rapid contraction is produced at the moment when the circuit is closed through the muscle, and another when the circuit is broken, but while the current is flowing steadily there is no contraction; the contractions at make and break occur both at the positive and at the negative poles; thus there are four varieties of contraction. Kathode = the negative pole; Anode = the positive pole.

1. Kathode closure contraction, K. C. C.
2. Anode closure contraction, A. C. C.
2. Anode opening contraction, A. O. C.
4. Kathode opening contraction, K. O. C.

The numerals indicate the relative strength of current needed to evoke the contractions; thus the first (K. C. C.) is produced

twice as readily as A. C. C. or A. O. C., and four times as readily as the last (K. O. C.).

In the diagnosis of certain classes of paralysis this sequence of events is altered, as will be seen below.

When continuous currents are strong enough to produce a tetanus it is spoken of as Duration tetanus; and there may be Kathodal duration tetanus—K. D. T., or Anodal duration tetanus—A. D. T.

All the muscular contractions just described are evoked, whether the stimulus is applied directly to the muscle or indirectly through its motor nerve-trunk.

Certain precautions are to be observed in the carrying out of electrical testing of muscles. The battery connections being first attended to, and the electrodes properly moistened, the indifferent electrode in its sheath is to be pushed down behind inside the collar of the dress, so that it rests upon the skin between the shoulders, or it may be applied to the skin over the sternum, and held there by the patient. When the examination is made upon a recumbent person, the indifferent electrode may conveniently be placed under the sacrum. The induction coil is to be used first. The operator must always adjust the strength of the current before touching the patient, and should never omit to test it upon his own moistened finger tips or thumb muscles in order to know exactly what he is going to submit his patient to. Then the testing handle, with one-inch disc electrode, is to be applied successively to the muscles to be examined, the key being closed when the electrode is in position. For most of the muscles of the body there are special points at which they are most sensitive to electrical stimulation; and so far as is possible these points should be chosen when testing, in order to save time and to evoke the contractions with the minimum of pain or discomfort to the patient. These "motor" points are figured in most of the books on medical electricity,* and their positions for the more important muscles of the body should be learnt, the best and most satisfactory way by far being by experiment upon one's own muscles. As far as possible the muscles should be tested directly, but the indirect testing through the motor nerve-trunks should not be neglected, because

* Plates of the motor points can be had separately from H. K. Lewis.

it affords a means of throwing into contraction some of the deep-seated muscles which are not easy to stimulate by the direct method. The current needed to produce K. C. C. when the testing electrode is placed over the motor point of a muscle is about 2 milliampères. In thin subjects, and when the muscle is close beneath the surface of the skin, contraction may be produced with 1 milliampère; conversely, in fat patients, and with deep-seated muscles, larger currents are needed. It is rarely necessary to go beyond 10 milliampères in testing muscles. Unless their contractility is very greatly impaired they will contract to that current. To persist with the test, using stronger currents, is to vex the patient unnecessarily. Of course it is presumed that the electrode is placed properly over the motor point.

Great assistance is to be found in a comparison of the muscles of the sound side with those of the affected side. It must not be assumed too readily that muscles will not react to the induction coil or battery, for the testing current may not at first be strong enough to evoke contractions, and, if necessary, its strength must be gradually increased. If, however, a current which produces vigorous contractions in the sound muscles will not cause the affected muscles to react, it is reasonable to regard them as not normal; and it is of no use to torment the patient with stronger and stronger shocks in the hope of eliciting a contraction, With properly moistened electrodes and well-moistened skin, the muscles should contract before the current has reached a painful strength. In the case of small children it is naturally a difficult matter to carry out a thorough test without making them cry, but one must make the best of it, and get the testing over as quickly as possible, beginning at once with fairly strong currents, and making the contacts as brief as possible with the aid of the testing electrode. A finger placed lightly on the tendon will often give proof that its muscle is contracting, before the contractions are powerful enough to produce movement of the limb or member.

Sometimes it is necessary to give young children an anæsthetic before any trustworthy results can be obtained.

Electricity owes its chief value in the diagnosis of nervous diseases to the reactions just described, because in certain cases

the reactions to the induction coil and to the battery are profoundly altered, while in others they remain almost or quite normal. In the altered electrical reactions known as the *reaction of degeneration* the nerves and muscles no longer respond to the interrupted current, and stimulation of the nerves by the battery current also produces no muscular contraction. On the other hand, the battery current applied directly to the muscles produces a contraction at make and break, of a slow and sluggish sort, quite unlike the rapid twitch produced in a healthy muscle; and besides, the reaction is of a different quality, for the greatest effect is produced by the anode, whereas in health the kathodal contraction is the greatest. These contractions, K. C. C. and A. C. C., to the battery current are those which occur at the moment of closing or completing the circuit. The contractions which occur at the moment of opening or breaking the circuit are less useful for this particular purpose, and may be neglected for the present. In the earlier stages of the reaction of degeneration the "sluggish" contraction is evoked very readily, the excitability of the muscle being increased; but subsequently this increase of excitability disappears, and a state of diminishing excitability follows.

The value of the reaction of degeneration lies in the fact that it is found only in paralysis due to disease in what has been named by Dr. Gowers the "lower segment" of the nerve-supply to the muscle,—that is to say, in the nervous tract which commences at the anterior cornu of grey matter in the cord (or the corresponding "nucleus of origin" in the case of the cranial nerves), and extends down to the motor-end plate in the muscle. Disease of the "upper segment," which is the name given to the tract commencing in the cortex of the brain, and extending down the lateral columns of the cord to the nuclei of origin or anterior cornua, does not give the reaction of degeneration. Thus a limb paralysed through injury to its nerve-trunk would give the reaction of degeneration; while the same limb paralysed through disease of the brain would not. Again, in infantile paralysis the reaction of degeneration is present in the affected muscles, because the anterior cornu of the cord from which their nerve-supply springs has been damaged.

SECTION III.

Application and Value of Electricity in Nervous Diseases.

Electrical treatment has been divided into two parts: 1, General; 2, Localised. This division is convenient in some ways. Thus in the treatment of general diseases the effects upon the body as a whole are made use of. The best method of carrying out a general electrisation is by means of the electric bath,—that is to say, by placing the patient in a bath of warm water and passing a current, either continuous or interrupted, through the bath longitudinally. Under these conditions the current passes partly through the water and partly through the patient. That which is carried by the water is wasted, but the remainder penetrates the whole body of the patient in an agreeable manner. The effect of this general electrification in the bath is most refreshing; the activity of all the tissues is increased, and the patient eats and sleeps better after it. It is of great value in states of debility, malnutrition, anæmia, and the like. It is not very much employed, because very few medical men have the means of applying it, and because it is not the only remedy for these morbid states. The electric bath is also of very great value in the treatment of muscular rheumatism, lumbago, and sciatica and rheumatoid arthritis, also in lead poisoning, and it sometimes proves useful in the less severe degrees of chronic myelitis and lateral sclerosis.

The interrupted current is the most universally useful, but the constant current bath with positive pole at the feet is also useful in the rheumatic conditions and in lead poisoning. For the continuous current bath large currents, and therefore large batteries, are needed. The total current through the bath should be about 200 milliampères. Of this the patient's body carries about 25 milliampères. Great care must be taken to raise and lower the current in a gradual manner, or with the large currents employed the shock to the patient may be severe.

The induction coil for the bath requires a secondary coil of few windings and fairly thick wire; the vibrator must work very smoothly and evenly, for the bath will be disagreeable unless the shocks are of uniform strength.

Other modes of general electrification are described in the special manuals of electrical treatment.* None of them are so satisfactory as the bath treatment. The bath itself should be made of wood or earthenware for convenience in management. Unfortunately baths are nearly always of metal. These may be utilised for the interrupted current at a pinch by joining the bath itself to one pole of the induction coil, while the other pole is fastened to a metallic electrode fixed in a large cork† which floats in the water over the patient, and can be moved about over the different parts of his body.

Hemiplegia.—Good results often follow electrical treatment of the paralysed limbs in the hemiplegic, and this is an important point, because so little can be done for them in other ways. Erb has reported cases in which a patient has regained considerable power in his paralysed limbs after a single brisk faradisation. The degree of paralysis which remains after an attack of hemiplegia varies considerably; and even in favorable cases the recovery may be tardy. When the cerebral lesion is a severe one, and is followed by marked secondary degenerative changes in the cord, electrical treatment is of no avail, but in a very large number of the less severe cases excellent results can be obtained. Electricity should, therefore, be tried in cases of hemiplegia. Treatment should not be begun until four weeks after the attack, in order to avoid the risk of setting up fresh cerebral mischief. When this period has elapsed systematic treatment with the induction coil may be commenced. The indifferent electrode is to be applied to the back of the neck, and an active electrode of large size to be well moistened and moved over the surface of the affected arm and leg; the current should be just strong enough to excite lively contractions of the muscles.

* Steavenson and Lewis Jones, 'Medical Electricity,' London, H. K. Lewis. Beard and Rockwell, 'Medical and Surgical Uses of Electricity,' London, H. K. Lewis. Erb, 'Electro-therapeutics,' Smith, Elder, and Co.

† A form of floating bath thermometer in a copper sheath, fixed in a square of cork, makes a good electrode for the purpose.

The treatment is to be repeated two or three times a week, for ten minutes at a time. At the end of a month the patient will have derived all the benefit which may be expected, and this improvement is very often considerable. It appears probable that the paralysis left by a hemiplegic attack may be more extensive than the actual destruction of fibres in the brain will account for, and that the electrical treatment favours the return of functional activity in those parts of the brain which have been injured though not destroyed by the cerebral lesion.

Infantile Paralysis.—This is a disease in which electrical treatment is of great value; but at the same time it is one which demands the utmost perseverance on the part both of the medical man, and of the parents of the little patients. After the close of the febrile attack which usually accompanies the onset of the disease, the damaged muscles rapidly waste to a greater or less degree; and the reaction of degeneration may be well marked in some of the muscles within a few days of the onset. It is better not to begin too soon with electricity, but at the end of three weeks the muscles may be tested, and the extent of the damage estimated; electrical treatment must then be begun and persevered with. It is customary to use the induction coil if the muscles react to it, but, if they do not, to use the battery current instead; in either case the active electrode is moved over the surface of the paralysed parts. There is at present by far too common a tendency to leave cases of infantile paralysis to themselves, in the belief that the muscles will recover spontaneously if the motor cells in the cord are not destroyed, or will remain incurably atrophied if these cells are destroyed. This, however, by no means represents the true state of the case. From a fairly wide experience of electrical testing and treatment in infantile paralysis, it may be definitely asserted that there are many cases in which children have weak and damaged muscles which continue to remain inefficient during years of such "expectant" treatment, although they present no reaction of degeneration. These are cases which will at once begin to improve with electricity, and will continue to improve if the electrical treatment be continued. There are also many cases where muscles, atrophied and degenerated for two or three years, and giving no response to any form of electrical stimulation, may be

made to grow and recover normal reactions by patient electrical treatment. The writer has also been able to test the muscles in a limb amputated seventeen years after the onset of the poliomyelitis, and in that case, although the limb had been absolutely useless for that length of time, reactions of a feeble kind were still present in many of the muscles, some responding normally to the induction coil, and others giving the reaction of degeneration only. On dissection the muscular fibres which survived were so pale and scanty that they could hardly be distinguished from the fat which surrounded them, but yet they showed by their reactions that they were not out of reach of electrical stimulation, and no doubt improvement could have been produced in them by prolonged electrical treatment. In taking so favorable a view of the results which can be obtained by electrical treatment we are supported by Duchenne, who has described in detail the case of a lad who recovered power in a previously wasted arm after two years of patient treatment. The paralysis had lasted over four years before electricity was commenced. Duchenne points out that there are usually a few surviving muscle-fibres, be the atrophy never so severe, and these surviving fibres can be cultivated and strengthened by the treatment, and may become centres for the regeneration of the muscle. In brief, the treatment of infantile paralysis is most encouraging, and should by no means be neglected in children. In patients who have reached the age of twelve years or upwards the prospects are less favorable, but even these may make some progress under careful treatment. The method of treatment to be followed may be with one electrode applied to the nape of the neck in the case of paralysis of an upper limb, and to the dorsal or lumbar region for the lower, the active electrode to be moved over the affected muscles for ten minutes three times a week. The induction coil to be used for the slighter cases; the constant current, negative pole, for those showing altered reactions. The strength of current must be regulated by the feelings of the patient, some children being more timid than others; but as a general rule the current should be as strong as they are able to bear without discomfort or distress. The skin should be well soaked in hot water to diminish its resistance. Two-inch electrodes should be used and kept in movement over the

affected muscles all the time. In this way children may bear the passage of three, four, or five milliampères; but if not, then smaller currents must suffice. Although the constant current is perhaps the best for these cases, yet an induction coil apparatus will give good results, and when the parents or the nurse are to carry out the treatment the coil is the best apparatus, as it is simpler and cheaper, and any failure in its action is easier to detect through the cessation of the audible vibration of the contact breaker. There is also no risk of damaging the patient's skin by electrolytic action.

A very convenient way of treating these cases when the paralysis affects the lower limbs is to arrange two metallic plate electrodes at the ends of an ordinary foot-bath of earthenware filled with warm water. The child can be put into the bath in a sitting posture with legs extended, and the coil current passed through the bath; the strength of current can be gauged by putting the hands into the water, one close by each of the electrodes. The bath can be given daily in the evening; after it the limbs are to be well rubbed, and the child put to bed. A little warm jacket can easily be contrived to cover the arms and trunk during the bath. Rubbing and manipulation of the affected limb, with some suitable gymnastic exercises, are of great advantage as auxiliaries in the treatment of this disease.

Injuries to Nerves.—The paralyses which follow injuries of nerves are also very favorable cases for electrical treatment. They include crutch and sleep palsies, and injuries from blows, wounds, or other forms of direct violence. These paralyses are commonly met with in the upper extremity. Facial paralysis also belongs to the same group. Its symptoms need not be described here. It is important to remember that the electrical examination of the muscles of the face must be carried out with very weak currents, as the skin is very sensitive, and the muscles lie close beneath the surface and can readily be thrown into contraction by a current (K. C. C.) of one milliampère. Great care must therefore be taken not to alarm the patient by the use of strong currents on the first visit. If the electrical reactions remain normal, and faradic irritability is not abolished, the prognosis is good, and the patient may be expected to recover in from three to four weeks. If there be a reaction of degeneration

a longer time must be allowed. As a rule, cases of facial paralysis recover, unless some progressive disease in the course of the nerve is the cause of it. The cases which come on spontaneously, and are usually ascribed to cold, may be expected to recover. Too confident a prognosis must not be given, as now and then an apparently simple case resists treatment obstinately. Cases of old standing are, as a rule, unfavorable.

Electrical treatment will often start improvement in cases which are stationary, and it is desirable to begin electrical treatment at once, and not to turn to it at a late stage of the complaint. Many cases of facial palsy recover without electrical treatment, but still its use should be had recourse to. Treatment with the induction coil for cases with normal reactions, and with the negative pole and constant current if the reaction of degeneration is present. The indifferent electrode to be applied to the back of the neck and the active electrode moved over the face, following approximately the lines of the main branches of the facial nerve. The electrode should, as far as possible, be kept away from the points of emergence of the main branches of the fifth nerve, as these are very sensitive to electrical currents.

The treatment of the different forms of *paralysis due to contusion, compression, or other injury of nerve-trunks* is very much the same as that of infantile paralysis; as a rule, they improve rapidly under treatment if the nerve-trunk is not actually divided or torn across. If that is the case, the question of a surgical operation to unite the ends must be considered. When a nerve-trunk is involved in scar tissue the cases are likely to be tedious, but even here perseverance with electricity will do a very great deal. Few forms of paralysis are more likely to improve under electrical treatment than those of damaged nerve-trunks. The prognosis should be a guarded one until the actual severity of the injury can be gauged. If the electrical reactions are not altered, and if the reactions to the induction coil are present, the case may be expected to recover within from four to six weeks; often it will be well in a much shorter time. Here, again, electricity will often start immediate improvement in neglected cases. The exciting cause of the mischief, if still present, must be removed. This applies, of course, chiefly to crutch palsy;

when there is a marked reaction of degeneration the early progress of the case must be watched, and the prognosis based on the state of atrophy, the amount of voluntary power present, and the response which follows the commencement of treatment. Often it happens that the state of improved nutrition and voluntary power begins to return before any change in the electrical reactions can be detected; in fact, this is the rule. In every case perseverance with the electricity, aided by rubbing and shampooing, is to be inculcated; in electrical treatment of these cases one need never despair unless perhaps when the wasting and paralysis grow worse in spite of all that is being done. When the reaction of degeneration becomes more and more difficult to elicit, requiring stronger currents than it did before, the prospects are unfavorable. It is important to localise the site of the lesion in the nerve-trunk as closely as possible, and to make careful notes of the state and distribution of the affected muscles with a view to observing its progress while under treatment.

Neuritis.—In the various forms of paralysis due to general or diffused neuritis the best treatment by far is by the electric bath; the induction coil and fairly strong currents are to be used, and the same treatment should be adopted in paralysis following specific fevers, of which diphtheritic paralysis is the type. If the electric bath is not to be had, then the induction coil may be used in the ordinary way, using large electrodes; or large sponges may be fixed to the electrodes (Fig. 27), and the current



Fig. 27.—Sponge-holder electrode.

applied by means of these to the whole of the affected parts. The patient must be guarded from risks of chill by using hot water and a well-warmed room, and it is often most convenient to apply the treatment at bedtime, as the patients will probably sleep all the better after the electrical treatment.

Lead-poisoning.—The treatment of lead-poisoning is slow ; in hospital patients it is usually made slower because the patients return to their work as soon as they begin to recover power, and then they again come into contact with fresh sources of lead-poisoning.

In this disease one may occasionally notice that muscles give a reaction of degeneration even before they are affected with paralysis; and conversely, the atrophy and paralysis may improve considerably before there is any return of the normal reactions.

The electric bath with constant current has been proposed in cases of metallic poisoning, as a means of eliminating the metal from the system. Lead can certainly be electro-deposited upon the copper electrodes of the bath from a patient with lead-poisoning. It is doubtful, however, whether the lead so deposited has been obtained from the tissues of the body, or whether it comes from the contamination of the surface of the skin with lead compounds. Further experiments are necessary before the point can be cleared up. The galvanic current, labile over the affected muscles, is the treatment most favoured.

Neuralgia.—Neuralgia sometimes yields quickly to electricity, at other times it is most obstinate. Often the pain is made worse by the induction coil, but with a very fine secondary wire of many windings and a rapidly vibrating contact-breaker an anæsthetic effect can be obtained, which has proved to be decidedly useful in many cases. Otherwise the electrotonic effect, which may be obtained with the positive pole of a constant-current battery, should be tried ; there must be no abrupt makes and breaks of current, and the strength must be raised and lowered very gradually by the use of a rheostat of about 10,000 ohms resistance. With this in circuit, and set for its maximum resistance, the current collector is slowly turned on to twenty cells, the contact of the electrode with the patient being steadily maintained ; the current is then increased by sliding the traveller of the rheostat from its maximum to a lower value, until five or six milliampères are indicated on the galvanometer. The electrode is kept moving over the neuralgic area, but without any interruptions of contact until the end of the sitting ; then the rheostat is again brought into use to lower the current,

and afterwards the current collector is turned off. Five minutes is a sufficient time for each sitting.

Sciatica is the form of neuralgic pain which most commonly comes under electrical treatment; the results are usually good, and may be manifested rapidly. Large electrodes and currents of 10 to 15 milliampères are to be employed. The indifferent electrode positive pole is to be placed on the sacrum or over the sciatic notch, while the other is moved slowly along the trunk of the nerve, and also applied to any painful points which may be present. The electric bath is also a valuable method of treating sciatica; one electrode may be placed near the posterior surface of the thigh, while the other is at the head of the bath, or the electrodes at the head and foot of the bath may both be used, and an accessory wire led from the foot-plate to a pad electrode placed under the thigh: this electrode must be covered with a flannel or wash-leather covering, or sores may be produced.

The treatment of *Lumbago* is similar in all respects to the treatment of *Sciatica*.

Hysterical affections may often be dispelled by electrical treatment, and many of the remarkable cures to be found in the early books on the application of electricity to medicine are of this sort. This use of electricity is none the less valuable in medical treatment because its effects are due to an action upon the mind of the patient; for in hysteria some such profound mental impression acting through the sensory nerves or otherwise is chiefly required, but the cures effected by its means can only be attributed in an indirect way to the electrical properties of the apparatus employed. Occasionally the mere sight of the electrical apparatus is sufficient to dispel hysterical symptoms.

The electrical treatment, though it may cure the particular symptoms which may be present at the time, does not alter the peculiar hysterical tendencies of the patient. In the anæsthesia, contractures, paralysis, painful joints, weak spines, aphonia, &c., local stimulation with the induction coil, either with the ordinary electrodes or with the wire brush, are to be used. The symptom often departs suddenly during the course of the first sitting, or else it may gradually disappear afterwards. It is seldom that more than a few repetitions of treatment are needed, and mean-

while other treatment to improve the patient's general state of health should be adopted.

Neurasthenia and Hypochondriasis.—Patients suffering from these conditions are usually very ready to try electrical treatment, partly on the principle of *omne ignotum pro mirifico*, partly from the general tendency of such patients towards remedial measures of all kinds. From electricity as from any other new thing they may seem to derive benefit for a time. Perhaps the best thing for them is to apply general electrification, particularly the electric bath with interrupted current. The general fillip to the system afforded by this may help to raise them out of their unhappy condition, especially if combined with a diet and regimen calculated to improve their digestive functions. In the majority of these cases some disorder of the alimentary canal, such as dyspepsia or constipation, will be found present, and should be dealt with.

Insomnia.—It has long been observed that patients sleep better after electrical treatment, and therefore electricity is a proper thing to try in cases of sleeplessness. General treatment with the induction coil, either in the electric bath or by means of large bath sponge electrodes moved over the trunk and limbs, will thus enable many patients to sleep soundly.

The treatment of *locomotor ataxy* and *progressive muscular atrophy* by electricity has been hitherto very unpromising, although the pains of ataxy have been alleviated by the treatment. Spasm and wryneck coming on in middle-aged people are also but little benefited.

Writer's cramp can be improved by persevering electrical treatment if the patients can be persuaded to give up their writing. Electricity is also useful in chorea, *epilepsy*, and affections of the *optic* and *auditory nerves:* the treatment proposed for these conditions is to be found in the special works on electro-therapeutics. It will suffice here to say that the distressing symptom of *tinnitus aurium* may often be relieved or cured by treatment with the galvanic current. The tinnitus is regarded as a hyperæsthesia of the auditory nerve, and therefore the anode is to be applied to the ears by means of a divided electrode (Fig. 28), the indifferent electrode being placed on the nape. There should be a thick covering of wetted absorbent wool

between the skin and the active electrode, which is to be applied just in front of the tragus. A current of 10 milliam-

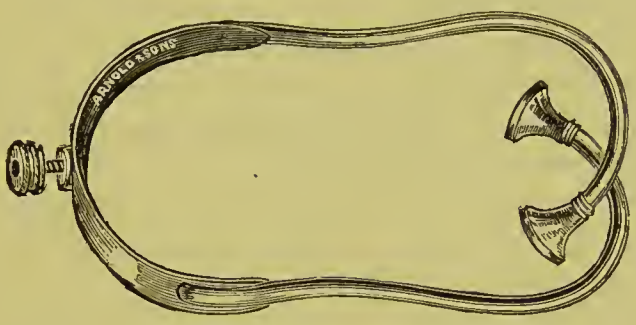


Fig. 28.—Divided electrode for treatment of tinnitus.

pères to be used for ten minutes, turned on rapidly, but turned off very slowly, and with the help of a rheostat. In favorable cases the tinnitus is modified during the passage of the current, and after a few sittings it becomes less continuous, and the remissions become longer and longer until the symptom at last disappears altogether. Many cases do not respond at all to this treatment, but it should be tried in all, as it becomes possible after four or five sittings to know whether any improvement may be expected from it.

Disorders of Circulation.—Dr. Barlow has recommended electricity in those cases of local asphyxia known as Raynaud's disease, in which the extremities become blue and cold and are liable to chilblains, or even to gangrene. The mode of treatment is as follows: the hand or foot is to be immersed in a basin of warm salt water in which one pole of the battery is placed, while the other is fixed to the upper portion of the limb, or to some neighbouring part of the trunk; the current should be as strong as the patient can bear. Dr. Barlow advises the use of the continuous current, but probably the interrupted current would prove equally efficacious. The same treatment is very good for patients who are subject to chilblains, and will prevent their formation, or dispel them, if the treatment is begun as soon as the first signs of the chilblains show themselves.

Exophthalmic Goitre.—The electrical treatment of this disease has had a good deal of attention paid to it, and from time to

time favorable results have been obtained and published. The most recent publication is an account by Dr. Rockwell of forty-five cases, and the method which he recommends is to use strong electrical currents, 20, 40, or even 60 milliampères. These are applied by means of electrodes of very large surface; the kathode over the pit of the stomach, and the anode to the nape of the neck. General electrical treatment by the electric bath or otherwise may be used concurrently.

Incontinence of urine is also a favorable subject for electrical treatment. In the reflex nocturnal incontinence of the young it is usually successful. One electrode is to be applied to the lower dorsal spine, and the other to the perinæum, and the interrupted current applied for six minutes followed by the galvanic current for three minutes. The galvanic current should be made and broken and reversed by hand; about fifty such interruptions will suffice. Current 3 to 5 milliampères, positive pole to spine, negative to perinæum. Improvement soon shows itself, but treatment must be continued for a month, or even longer, as the cases are very apt to relapse. When the incontinence is diurnal and due to weakness of the sphincter the best mode of application is by the introduction of a metal-tipped sound (Fig. 29) into the urethra, the indifferent electrode being

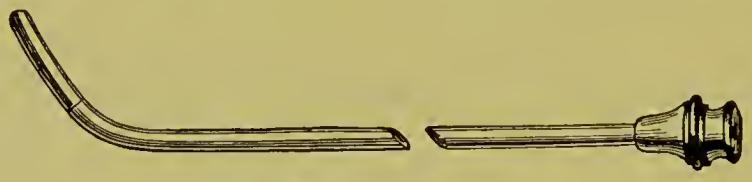


FIG. 29.—Urethral sound.

as before, the same treatment with the induction coil followed by galvanism should be employed. This condition sometimes follows when patients have been forced to hold their water for a long time. In women the urethral sphincter is at best an inefficient apparatus; and when there is a small want of tone in it the urine is apt to be expelled involuntarily during any muscular effort. Electrical treatment almost always improves or cures such cases. When the bladder symptoms form part of a general paralytic state affecting the lower part of the body, the local treatment described above will not be of use.

CHAPTER XV.

DISEASES OF THE BRAIN.

SECTION I.

Morbid States not necessarily Dependent on Organic Disease.

Diseases of the brain are of great importance because their diagnosis is often obscure at an early period, at which time medical treatment is most likely to be useful. In addition to this, there is scarcely any serious acute disorder in which this organ is not liable to be secondarily affected. The physician, therefore, has to watch in all acute, and in many of the chronic maladies he has to treat, for any manifestation of excitement or depression of the nervous system.

The slighter degrees of cerebral excitement are accompanied by headache, throbbing of the temples, sleeplessness, irritability of temper, partial delirium, and increased sensibility to light and sound. In the more severe the patient is violent, incapable of control, he ceases to recognise those around him, the delirium is noisy, his wakefulness constant, the pulse rapid, the head hot, the eyes glistening, the appetite is lost, and the other functions of the digestive organs are imperfectly performed. Sooner or later, nervous excitement terminates in depression.

When there is much depression, the patient lies on his back, is unwilling to be disturbed, and although he may be roused by shaking or any unusual excitement, he quickly relapses into a semi-conscious condition. The pulse is small, quick, and feeble, the head cool, the eyes sunken, and the urine is apt to collect in the bladder, from the loss of its normal sensibility. If the depression increase, there is irregular twitching of the muscles or picking at the bedclothes, the patient is incapable of being

roused, the pulse becomes rapid and irregular, the breathing quick and shallow, the sphincters lose their power, and life gradually becomes extinct.

Delirium.

This is always an alarming symptom. It may vary from a slight wandering of the mind to a state of maniacal fury, in which the patient is unconscious of all around him, and in which he fails to recognise his dearest friends.

It may arise from a number of different conditions. 1. It is a symptom which presents itself in most of the inflammatory affections of the brain and its membranes, and is then almost always accompanied by headache, and often by vomiting. The headache does not, as is the case in infectious fevers, cease when the delirium comes on. When delirium precedes a considerable elevation of temperature, or where it succeeds convulsions or unconsciousness, it is most probably due to cerebral disease. 2. It is a common result of exhaustion, whether this has been produced suddenly or slowly. For instance, where a person has been for some weeks affected with a febrile disorder, delirium not unfrequently occurs, and may easily mislead those who are in the habit of looking upon it as always an evidence of inflammatory action. 3. It takes place when the functional activity of any of the excreting organs has been greatly impaired, as in acute atrophy of the liver, Bright's disease, or congestion of the lungs. 4. An overheated state of the blood is sufficient to cause it; thus it often shows itself where the temperature has become greatly elevated, and disappears as soon as the superfluous heat is removed by treatment. Delirium scarcely ever occurs from this cause whilst the temperature is below 102° F. 5. Irritation of any important organ may give rise to it in a person of an excitable temperament. 6. Various poisons, such as belladonna, salicylate of sodium, and alcohol, produce delirium.

In all the more active forms of delirium you should remove from the patient every circumstance likely to excite him, and the directions before given for subduing mental excitement should

be attended to. Where hot bottles or mustard poultices are required, they must be removed at the proper time, as the patient is usually unconscious of the pain produced by their application, and consequently injury may result from their being too long maintained in contact with the skin.

1. In inflammation of the brain or its membranes, delirium will be relieved by shaving the head and applying bladders, or india-rubber bags, filled with ice; but, of course, the case must be otherwise treated according to its requirements, without reference to the mental excitement. 2. When you have reason to believe that it is the result of exhaustion, the skin being cool and the pulse weak and compressible, you must prescribe beef-tea, soup, wine, or brandy. Even a few doses of stimulants are often followed by immediate improvement. In these cases morphine and chloral are invaluable, by inducing sleep, and thus restoring the brain to the proper performance of its functions. You must, however, bear in mind that sedatives are contra-indicated by a comatose condition, by a contracted state of the pupils, by chronic kidney disease, and by pulmonary congestion. You must avoid the use of cold to the head, as tending to depress the patient's strength. 3. Delirium from imperfect excretion must be combated by stimulating the organ affected to increased activity, or by removing, through other surfaces, the effete materials accumulated in the system. Morphine and chloral should be avoided, and bromide of potassium, hyoscyamus, or Indian hemp employed if a sedative is necessary. 4. When you have reason to believe that the delirium is the result of an overheated state of the blood you must lessen the temperature. The most effectual means for this purpose is the cold bath, but, when this cannot be employed, you may use cold sponging, along with the "ice cradle." It is perhaps scarcely necessary to remark that the thermometer should never be placed in the mouth of a delirious patient; serious consequences have been known to follow such a proceeding. Salicylate of sodium, quinine, and saline medicines also tend to reduce the temperature of the body, and may be employed according to the circumstances of the case. 5. Delirium from reflex irritation should be treated with sedatives, such as bromide of potassium, chloral, or morphine, regard being also paid to the organ

primarily affected. 6. Besides alcohol, the effects of which will be considered by themselves, belladonna is not unfrequently the cause of delirium. It may result from the application of liniments or plasters, and the dilatation of the pupils, the dryness of the mouth, and the character of the delirium will at once give you a hint as to the cause.

Delirium Tremens.

Prognosis.—A first attack is rarely fatal, but the danger increases with each subsequent illness because the long-continued and excessive use of alcohol invariably produces structural changes in the tissues. The disease is, of course, less liable to terminate unfavorably in the young than in middle-aged or elderly persons. In an individual, otherwise perfectly healthy, very violent symptoms may subside, but if the case is complicated with hæmatemesis, pleurisy, pneumonia, or any other acute malady, it must be looked upon as very serious, even if the delirium is of a mild character. Any co-existing affection of the kidneys is especially apt to lead to a fatal termination, because they are the chief organs by which the alcohol is eliminated from the system.

The condition of the heart is the most reliable guide as to the danger of the patient. The more dicrotous, irregular, or intermitting the pulse, so much the more serious is the attack. You ought, therefore, to watch the state of the circulation at every visit, and as the changes are often rapid and unexpected, you must see your patient frequently in order to vary the treatment if necessary. Be cautious in your prognosis if you discover an hereditary tendency to insanity, for an excessive use of alcohol often leads to its development, and a craving for stimulants is sometimes one of the earliest symptoms of mental derangement.

Treatment.—The same general principles that regulate the treatment of all acute disorders must be applied to the management of delirium tremens. The patient, however, may present himself to your notice under very different conditions. 1. There is a premonitory stage when the intellect is still unim-

paired, but he is restless and unable to sleep, has a foul tongue, loss of appetite, high-coloured urine, and constipation. 2. The stage of excitement, in which he suffers from illusions of the senses, is delirious, with a quick pulse and sweating skin. 3. A condition of great depression, when he lies in a state of unconsciousness, with low, muttering delirium, broken, perhaps, by snatches of sleep.

A. There is considerable difference of opinion as regards the advisability of excluding alcohol from the treatment of delirium tremens. As a general rule, you will find it best to withdraw it entirely during the first two stages, not only in order to hasten its elimination, but also for the patient's future benefit; but in some cases where there is much thirst, a moderate amount of ale or porter, given alone, or mixed with some effervescing water, appears to act favorably on the nervous system. Persons who drink to excess are only too glad of any excuse for indulgence in their besetting sin, and are fond of quoting the orders of the physician as a reason for persisting in their evil habit. In the third stage, a carefully measured quantity of some form of alcoholic beverage is often necessary to support the action of a heart so long accustomed to an artificial stimulus. Here the pulse is your best guide, and the more this tends to become irregular or intermitting, the greater is the necessity for the use of stimulants. Where there is unconsciousness, or the patient has difficulty in swallowing, it is best to administer enemata of beef-tea mixed with brandy.

In the first stage you may often check the complaint by acting upon the digestive organs with a dose of calomel (F. 161), followed in a few hours by a saline aperient (F. 148). As soon as the bowels have been fully relieved, you should prescribe frequent and small doses of morphine along with ether (F. 174), or small doses of hyoscine. In all cases where there is a foul tongue, together with nausea or vomiting, a dose of calomel will probably be useful.

In the second and third stages you should be most careful to support the strength of the patient by means of beef-tea, soup, milk, or coffee, given frequently and in small quantities, as substitutes for the stimulus to which he has been accustomed. He should be regularly fed every two or three hours, and when

constant vomiting is present, nutrient enemata may be given.

B. However furious may be the delirium, you never employ venesection, or any other depressing measures, nor should you attempt to relieve the excitement by cold applications to the head. When the delirium is excessive, the skin hot and dry, and the pulse firm, you will find a combination of tartar emetic with opium the most useful remedy. Large doses of digitalis have been recommended, and as much as half an ounce of the tincture has been given, but this drug does not seem to have much effect upon the delirium, although it may be useful, in moderate doses, when the action of the heart is irregular or intermitting. The use of capsicum has been strongly recommended in the early stages of delirium tremens, and is said to induce sleep, but we have no experience of it.

C. In the slighter cases, and especially in the earlier periods, half-drachm doses of the bromide of potassium may be given every three or four hours; but in severe cases, or in the later stages, opium or chloral will be found necessary. Formerly, very large and often repeated doses of opium were looked upon as a specific for delirium tremens, but great mischief often resulted from the practice. As has been before said, small doses of morphine are valuable, after a free evacuation of the bowels, in the premonitory stage. In the second stage you may inject a quarter of a grain every three hours for three or four times, or give it by the mouth; but if this does not induce sleep, you had better omit it for twenty-four hours. Where the action of the heart is feeble, morphine must be used with great caution. Chloral has been recommended, but it is inferior to opium in its effects, and is more apt to depress the heart. A moderate dose, however, given along with morphine, often acts better than when either is administered alone. When convulsions are present the bromide of potassium, in half-drachm or drachm doses, should be administered and frequently repeated, in addition to morphine or chloral.

When the temperature is high, the "cold pack" sometimes proves useful, the patient falling asleep during its application, and if it succeeds, it may be repeated from time to time. In very many cases, all your efforts to procure sleep will prove

unavailiug until the third or fourth day of the delirium, when a moderate dose of morphine or chloral will suffice to give the patient a long and quiet rest.

When your patient recovers, you should use the opportunity of urging him to abstain entirely from all alcoholic liquors. It is of no use recommending moderation; nothing but entire abstinence will enable him to overcome his fatal propensity.

Amer.—In young and robust subjects, commence the treatment with a purgative, but in old and feeble persons this should not be done. Forbid alcohol in any form, and see that the patient is frequently fed with beef-tea, &c. In mild cases, the extract of opium ($\frac{1}{4}$ gr.) may be given, combined with quinine and digitalis. In the more serious attacks, recourse may be had to cannabis indica, hyoscyamus, piscidia, bromides, chloral, or paraldehyde. When the heart is feeble, chloral should not be given.

Germ.—Alcohol should be given if collapse is threatened. Chloral and other narcotics should be employed with caution. Strychnia may in some cases be used subcutaneously with advantage.

Convulsions.

These occur at all ages, and accompany very different morbid conditions. They may arise from a very slight irritation, or may be the result of incurable cerebral disease; they vary from the drawing in of a thumb or toe to general involuntary movements of all the muscles of the body. Children are especially liable to convulsions, which seem at times to replace in them the delirium of adult life.

Convulsions are most often associated with—1. Injuries to the skull, organic diseases, or inflammatory affections of the brain or its membranes. One of the most characteristic signs of convulsions connected with organic disease of the brain is their local commencement in the face, arm, or leg. 2. Exhaustion, as in cases of severe or prolonged diarrhœa in children. 3. Imperfect action of one of the excreting organs, especially of the kidneys. To this cause convulsions occurring during pregnancy are generally referred, as the urine is in most cases albuminous, although in some instances they appear to be of a purely epileptic character. 4. Convulsions are also apt to

present themselves in persons suffering from chronic alcoholism and lead poisoning. In the latter the attacks are always dangerous, and especially when they follow, instead of preceding, delirium. 5. They often usher in an attack of one of the eruptive or other fevers, such as scarlatina or measles. 6. In the case of children, convulsions are especially apt to occur in those suffering from rickets. The exciting causes of convulsions are very various, but the most common are the irritation of teething, an overloaded state of the stomach, or a disordered condition of the bowels.

Treatment (p. 27).—**A.** In children you must always search for some exciting cause. If the teeth are projecting, the gums must be freely divided; if you have reason to believe that the attack is due to an overloaded stomach, you should administer an emetic; a dose of calomel or an aperient enema is the best means of carrying off any irritating matters from the intestines. When the child is suffering from rickets, the treatment must be directed to overcome this condition as soon as the convulsions have been subdued. In puerperal cases it may be necessary to bring on labour, in case other measures have failed to afford relief. Where a diseased state of the brain seems to give rise to convulsions, the treatment must of course depend upon the nature of the original malady.

B. Venesection, formerly so invariably employed, is now restricted to cases of uræmic convulsions in young and healthy persons, especially where they occur during pregnancy. Some also recommend it in children when the convulsions are the result of cerebral congestion, but the application of leeches to the temples is ordinarily sufficient. In every case the bowels should be freely opened by a dose of calomel, or by an aperient enema. The application of an ice-bag, or of cold water compresses, is useful whenever there is increased heat of the scalp, accompanied by a pulse of tolerable strength, or when you have reason to believe that congestion of the brain is present.

You are called upon to employ stimulants when the patient is much exhausted by diarrhœa or some other depressing disorder, and they may be administered in the form of an enema if he is unable to swallow. When food can be taken, milk, beef-tea, or some other form of nourishment should be

frequently given. In such cases you must not apply cold to the head, lest you still further depress the vital powers. When the convulsions usher in an attack of eruptive fever you must be guided in your treatment by the pulse and temperature. If the latter is much elevated employ cold sponging or the cold bath; if it is below the normal point, the use of a warm bath or hot poultices to the chest and abdomen, together with stimulants and liquid nourishment, is indicated.

C. There are few cases in which some form of sedative is not required, as convulsions indicate an irritated and unstable condition of the nervous centres. The most useful of these remedies are bromide of potassium and chloral, which may be given either alone or in combination, and may be repeated frequently if necessary. Thus you may prescribe, for a child six months old, two or three grains of the bromide, or for one from six to eighteen months old, five grains three times a day, and, if necessary, add to this one grain of chloral. If the patient be unable to swallow, a somewhat larger quantity may be administered in an enema. Where these fail, in the case of adults, small doses of morphine may be used, either by the mouth or subcutaneously. The inhalation of ether or chloroform is invaluable where there is no organic disease of the nervous system, but it should be cautiously employed in uræmic cases. Its use is contra-indicated by a considerable elevation of temperature, a cyanotic tint of the skin, or stertorous breathing. We need not remind you again that in uræmia even small doses of morphine often act very energetically, and should be prescribed with caution. In children the early use of a warm bath will frequently obviate the necessity of the soothing remedies just mentioned, the head being kept cool with cold water whilst the body is heated by the bath.

In *hysterical convulsions* a douche of cold water often completely stops, or lessens the violence of, an attack. When there is tenderness over the ovarian region, firm pressure made over this part by the hand occasionally controls the convulsions. Faradisation is a useful measure, the electrodes being applied to the hands or neck. When all other remedies fail, the hypodermic injection of $\frac{1}{12}$ or $\frac{1}{16}$ of a grain of apomorphine is recommended. It produces nausea in about four minutes,

followed by vomiting, which usually puts an end to the convulsions.

An attack of hysterical convulsions may be often averted by the exhibition of a draught of ammonia or ether, and tincture of lavender (F. 70). In order to prevent the recurrence of hysterical convulsions, the patient's general health must be attended to. If anæmia is present you must prescribe iron, taking care that the bowels act regularly or are assisted by aperients; in other cases the valerianate of zinc will be found valuable (F. 233). Dr. Gowers states that turpentine, in ten-minim doses, gradually increased until slight symptoms of strangury are produced, is more useful than any other remedy in preventing attacks of this nature.

Neuralgia.

Pain affecting a nerve may arise from inflammation of its sheath or substance, or, as is more usual, it may be the result of irritation. In the latter case the neuralgia may be produced by any severe irritation occurring in a person otherwise healthy, or by a slight exciting cause in an individual whose nervous system is in an abnormally sensitive condition. Inflammation of a tooth, for example, will set up neuralgia in a healthy individual, which will subside as soon as the tooth is removed; whilst, on the other hand, excruciating pain in the fifth nerve may be produced by the mere exertion of speaking or eating in a person predisposed to the complaint.

The suffering is not necessarily felt in the nervous filaments immediately irritated; it may be referred to others at a distance. Thus pain of the back may result from an affection of the rectum in the male, or of the uterus or ovaries in the female; intercostal neuralgia is frequently produced by disease of the digestive organs or the uterus; sciatica may be due to some derangement of the kidneys, or to piles. In every case, therefore, you must not restrict your search for the source of the irritation to the nerves that seem to be the seat of the pain, but should investigate the condition of others that are connected with them.

The abnormal excitability of the nervous system that predisposes to neuralgia may be hereditary, but, where such is not the case, it may be produced—1. By anæmia, resulting from loss of blood, as, for example, from excessive menstruation or bleeding piles; or arising from a long-continued drain upon the system, as from leucorrhœa or prolonged suckling; or occurring after fevers or other diseases which deteriorate the quality, as well as lessen the quantity of the blood. In all probability, the neuralgic attacks which are so common in chronic kidney disease originate from this cause. Where neuralgia seems to have arisen from anæmia, the treatment must be directed to check any discharge that may be present, and to improve the quality and increase the quantity of the circulating fluid, by means of a generous diet, iron (F. 201), quinine (F. 215), cod-liver oil, and other tonics of a similar character. 2. Neuralgia may be often traced to gout or a gouty constitution, and in some cases no relief is obtained until inflammation of a joint diverts, as it were, the irritation from the nerve. When you have reason to suspect this to be the cause, the diet must be carefully regulated, alcoholic stimulants should be restricted or forbidden, and alkalies and colchicum (F. 13) administered. In some cases it can be traced to syphilis, and then iodine or mercury is required; those that seem to be connected with rheumatism should be treated with salicylate of sodium (F. 36) or iodide of potassium (F. 8). 3. Malaria is a common cause of neuralgia, especially where the supra-orbital branch of the fifth nerve is affected. It may present itself at a considerable period after all other indications of ague have subsided. Cases of this description require quinine (F. 216), arsenic (F. 225), a generous diet, and a moderate amount of alcohol.

An abnormal excitability of the nervous system is due in some cases to an excessive use of alcohol or tobacco. It is not necessary that large quantities should have been consumed, for in some persons a comparatively small amount seems to be deleterious. Where you have reason to suspect such to be the case, indulgence in them must be strictly forbidden.

As a general rule, persons who suffer from neuralgia are unable to bear depressing treatment, consequently mercury and saline aperients must be prescribed with caution. Even a long course

of alkalies is apt to depress; when this occurs, the medicine should be omitted for a time, or be combined with a tonic. The diet ought to be nutritious, should contain a sufficient amount of animal food, and in most cases some form of alcoholic stimulant is required.

Sedatives are generally necessary to relieve the paroxysms of pain. Morphine is the most effective, and may be given by the mouth or may be injected subcutaneously. It should, however, be borne in mind that the relief thus afforded is very apt to lead to a habit of frequent indulgence in this drug, and that the patient may become so completely a slave to it as to be unable to abandon its use after the neuralgia has been cured. It is always wise to begin with a moderate dose of morphine when it is given subcutaneously ($\frac{1}{10}$ gr. to $\frac{1}{6}$ gr.), and the dose may be increased when you find how the patient bears it. When nausea follows its use, $\frac{1}{120}$ gr. to $\frac{1}{60}$ gr. of atropine may be added, or the extract of belladonna ($\frac{1}{6}$ gr. to $\frac{1}{3}$ gr.) may be given by the mouth. Indian hemp is often very useful, and may be combined with the bromide of potassium. Antipyrin has of late been largely employed to relieve neuralgic pain, and may be given in doses varying from ten to thirty grains. Phenacetine (8 grs.) is also useful.

Neuralgia is often relieved by local treatment; thus blisters may be applied, and $\frac{1}{4}$ gr. of morphine sprinkled each day on the raw surface. In spinal neuralgia the actual cautery is sometimes used. In some cases stimulants, such as an infusion of capsicum or the turpentine liniment, may be employed, alone or mixed with some sedative. The chloroform liniment is a useful application, or it may be combined with an equal quantity of the belladonna liniment, and may be sprinkled on spongiopiline wrung out of hot water, and applied to the painful part. In other cases, especially where the pain is confined to a small space, the glycerine of belladonna (F. 196), or the liniment of aconite, may be painted on the part two or three times a day. Camphor-chloral, made by rubbing up equal parts of camphor and chloral, may be applied on lint, but it is not so efficacious as the applications before mentioned.

In some obstinate cases the application of electricity affords relief (p. 306).

To prevent the recurrence of neuralgic attacks, a course of tonics is generally required. Iron (F. 201), quinine (F. 199), strychnine (F. 228), alone or in combination, valerianate of zinc (F. 233), phosphorus (F. 231), salicine (F. 212), or one of the mineral acids (F. 210), are those generally prescribed. The diet of the patient should be carefully regulated, and exercise and warm clothing recommended.

Pains of the Head.

This is one of the most frequent complaints requiring the attention of the practitioner. A number of different affections may give rise to it, which require to be carefully distinguished.

1. Neuralgic headache is a common accompaniment of tumours and other diseases of the brain. The pain is generally very severe, and is chiefly experienced in the course of the nerves. It also often arises from anæmia, mental exhaustion, and other depressing conditions, as well as from affections of the teeth and ear. In every case, therefore, these organs should be first carefully examined, and any condition requiring surgical treatment should be rectified. The straining of the eyes in reading by short-sighted persons is a common cause of headache, and can be obviated by the use of proper spectacles. Neuralgic headache is generally relieved by food and stimulants, and is increased by fatigue or excitement. Pain at the top of the head, or a little to one side of the median line, often results from hysteria and nervous exhaustion. Neuralgic headache is best treated by stimulants (F. 70), and, when very severe, by a moderate dose of morphine or chloral (F. 108). A dose of antipyrin (15 to 20 grs.), or of citrate of caffeine (5 grs.), will often avert an attack if taken before the pain has become severe, and in some cases a piece of wool dipped in a solution of cocaine (10 per cent.), or of morphine, and placed in the auditory meatus, will afford relief. The tincture of gelseminum, and the hydrate of butyl-chloral, or phenacetine, are occasionally employed for pains of the face or side of the head. In the intervals of the attacks the strength must be improved by tonics, such as iron (F. 200), quinine (F. 215), strychnine (F. 228), by a liberal diet, and

a moderate amount of alcohol. Malt liquors are especially useful.

2. Rheumatism occurs frequently in the scalp. There is general tenderness over the head, the pain being increased by pressure, by movements of the brows, or any other action of the neighbouring muscles. It often arises from exposure to cold, and is best treated by iodide of potassium, diaphoretics, warm baths, and alkalies (F. 18); or if there is any rise of temperature, by salicylate of sodium (F. 35) or chloride of ammonium (F. 119).

3. Syphilitic periostitis is a common cause of severe headache. The pains are increased at night, and the bones of the skull are very tender on pressure. You should treat such cases with iodide of potassium (F. 11) in the day, and with calomel and opium at bedtime.

4. Dyspeptic headaches occur shortly after food or during the time when digestion is going on. The pain is generally of a dull character, and is often accompanied by giddiness, whilst other signs of dyspepsia, such as acidity, flatulence, and constipation, are present. Such cases must be managed according to the principles that govern the treatment of the form of dyspepsia from which the pain of the head arises.

5. What is popularly termed "bilious headache" is a very common affection. The pain is accompanied by vomiting, and often by intolerance of light and sound. The attacks come on occasionally, and without any apparent cause; the digestion is habitually imperfect, and the bowels much constipated. An attack may often be prevented by a dose of antipyrin or phenacetine, given as soon as the pain begins. When the headache and vomiting have become severe you can do little to relieve, except by the application of cold water or an ice-bag to the head. You may prescribe an aperient as soon as the nausea and vomiting subside. In the intervals of the attacks you should carefully regulate the diet; pills of podophyllin (F. 162) are most useful in maintaining a free action of the bowels, and a long course of liquor potassæ and bromide of potassium seldom fails to afford relief (F. 114). Indian hemp is much employed by some practitioners, and may be prescribed either in the form of tincture or extract. In long-standing and obstinate cases you

may give arsenic (F. 2), at the same time that you keep the bowels open with podophyllin. All alcoholic stimulants should be forbidden, and the patient encouraged to take regular exercise in the open air.

Neuralgia of the Face.

Pains confined to the face alone are, in most instances, the result of some irritation of the gums, nose, or ear, and soon cease when the cause is removed. But cases accompanied with intense suffering occur, in which it is impossible to ascertain the exciting cause.

Treatment (p. 27).—**A.** Search most carefully for some local cause of irritation, especially in the gums, nose, eyes, or ears. If you fail to discover a sufficient reason for the pain, ascertain if your patient has suffered from syphilis, gout, rheumatism, or malaria; and if so, direct your treatment accordingly.

F. The diet should be nutritious, but when the pain is very severe it is often necessary to restrict the patient to liquids, for the slightest attempt at mastication may bring on a severe paroxysm. If you discover that any discharge likely to produce anæmia is present, such as leucorrhœa or menorrhagia, you must employ remedies to restrain it.

H. Where there is evidence of nervous exhaustion you may prescribe phosphorus, either in the shape of pills or dissolved in oil, along with cod-liver oil. As a general rule, however, it is less useful than some of the mineral tonics.

In every case, on account of the excessive suffering, you must have recourse to sedatives, and it will be necessary to vary, from time to time, the drugs you prescribe and the method of administration. Morphine is, without doubt, the most valuable, especially when employed subcutaneously. In some cases it acts beneficially when placed in the ear, or liniments of opium may be rubbed on the affected parts. Antipyrin and phenacetine possess considerable analgesic powers, and are exceedingly useful in the treatment of recent cases. Liniments of belladonna (F. 194), aconite (F. 191), or chloroform (F. 195) may be employed where morphine fails, or the veratrine ointment

may be had recourse to. Chloral and bromide of potassium internally are less useful than morphine.

Various nervine tonics are prescribed for the relief of facial neuralgia, but arsenic is the most useful (F. 1). It should be given at first in a small dose, which should be increased every third or fourth day until the physiological effects are produced in a slight degree. Where arsenic fails, zinc (F. 233), iron (F. 199), or strychnine (F. 228) may be employed.

In many cases of a chronic character a continuous current of galvanism is of great service. It should be used at first weak, its strength and duration being gradually increased (p. 306).

Sciatica.

The sciatic nerve is frequently the seat of neuralgia, and the affection is often very rebellious to treatment. You should first ascertain that the nerve is really implicated, for rheumatism of the hip-joint, syphilitic periostitis of the trochanter, and various other affections are often confounded with it. Sciatica may be the result of some abnormal condition of the pelvic organs, especially of the rectum, so that in every obstinate case the state of this part should be carefully ascertained. More generally it is of a rheumatic or gouty character.

Treatment.—**A.** It is of great importance to keep the large intestine empty, and this is best effected by means of the sulphate of sodium or magnesium, given in repeated doses during the day (F. 150). In older persons sulphur and guaiacum (F. 133) are to be preferred, as they act on the bowels without diminishing the strength of the patient. When he has suffered from gout, colchicum, along with alkalies, may be prescribed; in case of rheumatism the salicylate of sodium or the iodide of potassium or guaiacum may be used according to circumstances.

B. In the earlier periods, especially where there is much tenderness on pressure over the nerve, blood may be removed from the seat of the pain by cupping or leeches, followed by hot poultices or fomentations.

C. Sedatives are generally necessary. When the suffering is

severe, morphine, or morphine and atropine, may be injected subcutaneously, or a suppository or pessary containing these substances may be used. Where the pain is more moderate, bromide of potassium (F. 114), chloral, or Indian hemp may be prescribed, or liniments of belladonna, chloroform, or opium may be employed. When the case is of long standing, and there is only slight tenderness, you may use stimulant applications, such as fomentations of capsicum, or a liniment of turpentine or croton oil, or an ointment of tartar emetic. When the pain is situated about the sacrum or lower lumbar region, the thermic hammer is especially useful.

In the later stages of sciatica, when there is a loss of muscular power, the continuous galvanic current is of use by stimulating the muscles and relieving the pain. In chronic cases the stretching of the nerve has sometimes afforded relief. This is best effected by flexing the thigh on the abdomen, and forcibly extending the leg whilst the limb is maintained in its position.

F. In all cases flannel should be worn, and exposure to wet and cold carefully avoided. Tonics are generally requisite at some period of the case, and may be combined with aperients. The best of these are quinine (F. 217), arsenic (F. 2), strychnine (F. 228), and, in case there is anæmia, iron (F. 199).

Paralysis.

This condition may arise from any cause that interferes with the conducting power of the structures by which the will acts on the voluntary muscles; and, consequently, it may result from an abnormal state of the motor fibres in the brain, spinal cord, or nerves, as well as from anatomical changes in the muscles themselves. The prognosis, and also the treatment, vary accordingly.

The most common causes of extensive paralysis are hæmorrhage, embolism, or thrombosis of the vessels of the brain or spinal cord; but it may also result from softening, tumours, or sclerosis affecting the nervous centres. Local paralysis may result from lead-poisoning, or may occur after diphtheria; more rarely it follows an attack of one of the other infectious fevers.

The prognosis in such cases is chiefly dependent upon the nature and extent of the primary disease. In old persons, recovery from paralysis is usually slow and imperfect. In any case, the more complete the palsy and the longer the time before improvement begins, the smaller is the chance of cure. When early contraction of the muscles shows itself, the prospect of a complete restoration is unfavorable. Little can be expected from treatment where contraction has taken place from muscular shortening. A rapid recovery of a hand or foot, without improvement in the other limb, is unfavorable to the eventual restoration of the powers of the latter. In lead-palsy, the more acute the attack, the better the prospect of recovery. "Wrist-drop" is generally overcome, but the progress is slow. Paralysis following chorea or hysteria always disappears under proper treatment. In cases of epilepsy, the prospect of cure depends upon whether there is any co-existing disease of the brain. Where this is not the case, the loss of power is usually of short continuance.

The prognosis is favorable when the paralysis has resulted from a rheumatic affection of a nerve; it is hopeless where a nerve has been pressed upon or disorganised by a tumour or diseased bone. If the loss of power seems to arise from degeneration of the muscular fibres themselves, the prognosis, as regards perfect recovery, is bad, as in most of such cases the atrophy is connected with an alteration in the nervous centres or a destruction of the nerve-fibres. By appropriate treatment, however, considerable benefit may be produced in some of the cases of this description. In recent and slight cases of paralysis from lead, the prospect is good.

Treatment.—**A.** In hemiplegia, the paralysis is usually the result of some morbid condition of the brain, and we have, therefore, no causal indications to direct us; but where syphilitic disease of the nervous centres is present appropriate treatment is required. When it is connected with hysteria or chorea, you must attempt to restore the general health by tonic treatment; the diet should be nutritious, and, if possible, change of air and scene should be obtained. In lead-palsy, iodide of potassium should be given in three to five grain doses, three times a day, but, at the same time, the bowels must be acted upon by sul-

phate of sodium or magnesium, as the iodide not unfrequently brings on attacks of colic.

F. Pay attention to the digestive and assimilating organs. In hemiplegia from cerebral disease the excreting structures chiefly require attention, whilst in hysterical or choreic cases the chief aim must be to remove any morbid state of the stomach or bowels that may be present. In the paralysis of the œsophagus which sometimes follows diphtheria, the patient must be fed by the use of the stomach-tube. Tonics should be given, such as iron, strychnine, or quinine, and the bowels regulated by mild aperients.

H. Innumerable methods have been proposed to stimulate the affected muscles. Formerly it was the custom to administer strychnine in all cases of paralysis. This drug is now rarely given, excepting where there is reason to believe that the loss of power arises only from a functional defect, or where it follows diphtheria, hysteria, or lead-poisoning. In hemiplegia resulting from an affection of the brain, even a small dose of strychnine not unfrequently causes sleeplessness and twitching of the muscles of the paralysed limbs.

Injections of strychnine (one sixtieth to one thirtieth part of a grain) into the muscular fibres have been recommended, and in some cases benefit seems to follow their use. Stimulating liniments are generally of advantage, by keeping up the circulation in the palsied parts. They may be composed of turpentine, acetic acid, ammonia, &c. Baths of salt or other stimulants are also in common use. Passive motion is often very beneficial; shampooing may be employed in all chronic cases, to maintain the nutrition of the muscles. To prevent contractures, the limbs should be placed upon splints, or, when the fingers are affected, a ball may be placed in the hand to keep them extended.

Electricity is the most valuable means at our disposal; it may be used either as a continuous or an interrupted current, and the galvanism may be applied to the muscles themselves, or may be passed along the course of the nerves leading to the affected parts. In an ordinary case of hemiplegia, electricity should not be used before five or six weeks after the attack, as its early employment has not unfrequently proved injurious.

The faradic current is especially valuable in hysterical and in diphtheritic cases. For details of this method of treatment see p. 299.

SECTION II.

Acute Diseases of the Brain.

Congestion of the Brain.

Although this term is often applied merely to explain certain cerebral symptoms the cause of which is not evident, there is no doubt that congestion of the brain is a frequent, and also an important condition. It may occur along with, or independently of, other diseases, and may consist in a general or a local repletion of the blood-vessels. It may arise from an increased determination of the arterial, or from an imperfect escape of the venous blood from the cranium. The most dangerous cases are those in which apoplexy or delirium is present.

Treatment (p. 16).—**A.** The causes of cerebral congestion vary greatly, and are often difficult to discover. In middle life excessive mental exertion is one of the most common, and must, of course, be forbidden. When a plethoric condition of the system seems to have given rise to it, a spare and non-stimulating diet should be enforced. If the patient has been in the habit of indulging to excess in alcoholic stimulants, these must be withdrawn. In the young, and also in old people, exposure to the heat of the sun sometimes acts as an exciting cause of cerebral congestion, and consequently care should be taken to avoid it. Where the congestion is the result of heart disease, whooping-cough, or some other form of obstruction to the venous circulation, the treatment of the primary disorder is to be mainly pursued.

B. You should limit the employment of venesection to cases in which there is coma or delirium, the symptoms being urgent, the pulse firm, and the patient robust. Here the abstraction of

blood often affords marked and immediate relief. You may lessen the congestion in less urgent cases by the use of cupping to the neck, or of leeches to the temples or over the mastoid process. In children leeches are usually sufficient; in cases of local congestion in adults, as when it is caused by the pressure of tumours of the brain, they generally afford relief. In old and feeble persons dry cupping is often very serviceable. The use of a bladder filled with ice, or of a Leiter's coil, to the scalp is one of the best means of reducing cerebral congestion; but the application must be continued for many hours to be of much service. Mustard blisters to the neck and feet are also useful. In all cases you should act freely upon the bowels, so as to remove from the circulation a considerable quantity of fluid. For this purpose you may, when the symptoms are urgent, employ calomel (F. 161) or croton oil; when less active measures are indicated, sulphate of magnesium (F. 148), tartarated soda, or some aperient mineral water may be prescribed. As soon as the vascular system is sufficiently depleted, frequent doses of bromide of potassium may be given, to equalise the cerebral circulation and to soothe the excitement of the nervous system.

D. During an attack, whether the congestion be local or general, the head must be kept raised, so as to favour the return of the venous blood. You should afford rest to the brain by restricting bodily exertion to what is absolutely necessary, forbidding any mental excitement, and preventing any undue amount of light or sound.

E. The diet should consist of beef tea, milk, and farinaceous food, but in old and feeble people a more stimulating diet and a moderate amount of alcoholic stimulants are usually necessary.

Simple Meningitis.

Prognosis.—Inflammation of the membranes of the brain is always attended with extreme danger, partly on account of the importance of the organ attacked, and partly because it is usually the result of some other serious disorder. Idiopathic meningitis is very rare, inflammation of the cerebral membranes usually resulting from an injury to the head, disease of the ear or nose, syphilis, or some structural change in the brain. The prognosis

is most hopeful when we are unable to discover one of these conditions. The duration of meningitis is seldom more than ten days. The more favorable cases are those that follow an injury to the head; purulent meningitis is almost always fatal; whenever the patient becomes comatose the prospect of recovery is very small, especially if coma occurs at an early period of the disease. Although it often follows abscess of the internal ear, you must not necessarily conclude that meningitis is present whenever serious symptoms make their appearance in aural disorders, for various cases have been diagnosed as meningitis, which have been suddenly relieved by a copious discharge of pus from the ear.

Treatment (p. 16).—**A.** Any injury of the head followed by the indications of meningitis requires careful surgical treatment. When a discharge from the ear is present, you should apply fomentations and poultices, so as to encourage the escape of the pus, and thereby prevent its accumulation in the interior of the organ. In every case of meningitis the ears should be most carefully examined, and means taken to give vent to any collection of pus that may be discovered.

B. When you are unable to discover suppuration in any of the bones of the skull, you will find it advantageous to use venesection to a moderate amount. This should, however, be only practised if the patient is young and vigorous, the pulse firm, and the onset of the symptoms recent. Where general bloodletting seems to be contra-indicated, leeches may be applied to the temples, or cupping used to the neck; in children, leeches only are required: if the patient be old and feeble, dry cupping to the neck may be substituted. In all cases the head should be shaved and covered with an ice-bag, or with cloths wrung out of ice-cold water; the bowels must be freely purged by means of salines (F. 148), with or without the addition of tartar emetic, or if there be vomiting, a dose of calomel or croton oil may be placed upon the tongue. Calomel used to be always given, so as to produce salivation, but it is now rarely used excepting in traumatic cases. In such cases it is often more convenient to use mercury by inunction than by the mouth, a piece of mercurial ointment being rubbed into the armpits and groins every four hours until the gums become sore.

When the meningitis arises from pyæmia, and is from the first attended by great depression of the system, stimulants, such as ammonia, alcohol, and ether, are required. In like manner, when the patient is exhausted by the disease, these remedies are necessary, and the application of blisters to the neck is then advisable. Some practitioners are of opinion that the only treatment likely to be of service in septicæmic cases is the frequent exhibition of large doses of the perchloride of iron.

C. As the pain of the head, although often excruciating, depends on the inflammation, sedatives are seldom given, the ice-bag and depletion affording relief more rapidly. In cases of suppuration in the ear, morphine must be prescribed in order to relieve the severe suffering. If convulsions occur, frequent doses of bromide of potassium or some other sedative are indicated; and when there is continued sleeplessness or great restlessness, chloral may be given with advantage.

D. Let the head be raised, so as to facilitate the return of the venous blood from the brain. The room must be kept quiet and dark, and, during the delirium, the patient should be carefully watched.

E. In the acute stage the diet should consist of milk and farinaceous food, but if signs of exhaustion present themselves, soup, beef-tea, and stimulants are required. Delirium may continue during this period from exhaustion, but the head will be cool, the face pale, and the pulse weak and compressible.

Vomiting is best treated by the exhibition of ice and the use of two mustard blisters at the same time, one being applied to the back of the neck, the other to the epigastrium.

Amer.—Cupping or leeches may be applied to the neck; the head should be kept cool by means of powdered ice, and an active purgative given. The tincture of aconite may be prescribed (one to three drops every two hours). If there is much restlessness, bromide of potassium, with small doses of chloral, may be administered.

Fr.—In the early stages venesection, cupping, or leeches may be employed, according to the strength of the patient. Ice must be applied to the head and a brisk purgative given. Mercury should be rubbed into the thighs until salivation is produced. When there is much delirium, bromide of potassium may be given. In syphilitic cases the iodide of

potassium is indicated; in those connected with acute rheumatism, blisters ought to be applied to the larger joints.

Germ.—The head should be shaved, and ice applied continuously. Leeches may be used in the early stage. For excessive pain or restlessness, morphia may be injected subcutaneously. Mercury and iodide of potassium are of little value.

Tubercular Meningitis.

Prognosis.—Although the duration, which varies from seven to twenty-one days, is longer than that of simple meningitis, this disease is much more certainly fatal, as scarcely a well-authenticated case of recovery is on record. It should, however, be remembered that we have no means of distinguishing with certainty between the simple and tubercular forms of the disease, and that in every case the diagnosis is only one of probability. If coma has not occurred before the end of the third week, the case is probably not tubercular. Authors often point out that shortly before death the patient may recover consciousness, and they warn their readers not to look upon this as a favorable sign. But you will find such apparent improvement very rare, the patient in most cases gradually, but steadily, getting worse from the first. Do not forget, however, that children who have been much exhausted by diarrhœa or injudicious feeding are liable to anæmia of the brain (hydrocephaloid disease), and that the symptoms of this condition may very closely simulate those of tubercular meningitis. Under such circumstances warmth should be constantly applied to the surface of the body, and the child should be frequently fed with milk or beef-tea, combined with small quantities of brandy.

Treatment (p. 16).—**A.** When the symptoms of tubercular meningitis present themselves, you have no causal indications for treatment. But as in the majority of cases the patient has been for some time previously out of health, the fatality of the brain affection should induce you most carefully to treat any premonitory symptoms. The chief means at your disposal to obviate tubercular mischief are a careful regulation of the digestive functions, fresh air and exercise, cod-liver oil, and preparations of iron and iodine.

B. In tubercular meningitis you must follow the same line of treatment as in simple inflammation of the cerebral membranes. Venesection is never required, but where the pain is severe, the use of leaches to the temples and of an ice-bag to the head tends to relieve it. In children, vomiting is rarely absent, and is best treated by a dose of calomel, followed by a purgative enema or a saline aperient. Calomel was formerly used to produce salivation, but this has now fallen into disrepute. Some practitioners recommend iodide of potassium, but it seems to exercise no influence over the progress of the malady. Blisters are often prescribed, but they only add to the discomfort of the patient, without affording any relief. Trephining has been recommended as a means of relieving the intra-cranial pressure, but it has no curative value.

C. When there is a tendency to convulsions bromide of potassium is beneficial. If the pain be excessive, as is often the case when adults are affected, you may afford relief by the use of chloral (F. 108), or morphine, given subcutaneously or by the mouth. In the case of children, frequent doses of bromide of potassium, combined with hyoscyamus or chloral, are more effectual to relieve pain and allay restlessness. Constipation is best overcome by a moderate dose of calomel and jalap, or by an enema, but severe purging had better be avoided.

E. The diet should be light and nutritious, and should consist of liquids, such as milk, beef-tea, chicken broth, &c. All alcoholic and other stimulants should, as far as possible, be avoided.

B. *Amer.*—Ice-bags should be applied to the head. Mercury is useless. Iodide of potassium is recommended, but its value is very doubtful. Two grains every four hours may be given to a child three years old. Constipation is best treated by a dose of calomel.

Fr.—Never bleed or leech. Avoid mercury, moxas, and setons. Ice should be applied to the head. Iodide of potasssum, combined with quinine, seems at times to have been followed by favorable results.

Germ.—Tepid baths should be used to the body and ice to the head. Calomel may be given (½ gr. every two hours). Iodide of potassium may be tried (15 grs. daily for a child three years old).

C. *Amer.*—If there is much restlessness, bromide of potassium, chloral hydrate, or hyoscyamus may be administered.

Germ.—If there is great restlessness, narcotics may be prescribed.

Apoplexy.

Prognosis.—An apoplectic fit may result from hæmorrhage or from an obstruction to a cerebral artery, produced by an embolus or thrombus. As it is difficult, and in many cases impossible, to determine from which of these causes the fit has arisen, it is better to consider it under the general term of apoplexy. A person who has been suffering from diseased heart or kidneys is placed in imminent danger by any considerable interference with the cerebral circulation; consequently the previous state of the patient's general health is a most important point in the prognosis.

Cases that commence with severe pain in the head and vomiting, and those in which hemiplegia is quickly followed by deep coma, are always of a very dangerous character. The same may be said of such as are attended by general convulsions. The danger is ordinarily in proportion to the depth of the coma and the amount of paralysis. If the coma has not begun to diminish at the end of twenty-four hours the prospect of recovery is small. Where there is loss of power on both sides the prognosis is bad, as hæmorrhage has probably taken place into the ventricles, the arachnoid space, or into the pons Varolii. Likewise, when the automatic muscles are involved, there is great danger, and therefore a deviation of the head or eyes, or a deficient action of the intercostal muscles, is of evil omen. Most cases die where there is a marked interference with the respiration, such as sighing, Cheyne-Stokes breathing, or an accumulation of mucus in the bronchial tubes. A very low temperature at the commencement of an attack, or a considerable rise of the temperature within a few hours after it, is a bad sign, as is also the appearance of albumen or sugar in the urine. Most cases die when a bedsore presents itself before the end of the first week.

As regards the probability of complete recovery from the subsequent paralysis, you must be chiefly guided by the extent of the palsy, and the amount of improvement that takes place in the first few weeks after the fit. Where there is rapid wasting

of the muscles, or much pain and stiffness on motion, you cannot hope for permanent improvement. A limb in which some return of movement takes place before the end of the first month, is likely to recover a useful amount of muscular power.

Treatment.—**A.** If you see the patient during the stage of unconsciousness, you may find him in a state suggesting either the idea of congestion or of anæmia of the brain. The face may be flushed, the head hot, the pulse firm ; or the opposite conditions may be present. In the former the head must be raised, and kept cool by the application of an ice-bag; in the latter it should be laid low, and all depressing treatment avoided.

B. There is no disease in which the opinions and practice of the medical profession have undergone a more complete change than in apoplexy. Formerly, a practitioner was looked upon as guilty of the grossest neglect if he did not open a vein as soon as he was called to a patient in a state of coma; there are, at the present day, many who teach that venesection is always useless or injurious. We might suppose that free depletion would lessen the tension of the vascular system and prevent a recurrence of the hæmorrhage, or that by it we might diminish cerebral anæmia, where this was dependent on an excess of venous blood in the brain. Theoretically we should, therefore, restrict venesection to cases of hæmorrhage, but should avoid it wherever there was a suspicion that the apoplexy was the result of embolism or thrombosis. In practice, however, we are often unable to determine with certainty the cause of the fit, and we must regulate our treatment by the general condition of the patient. The following advice upon this important point given by Niemeyer seems to be judicious.

"If the impulse of the heart be strong, and its sounds loud, if the pulse be regular, and no signs of commencing œdema of the lungs exist, we should bleed without delay. Local bleeding by leeches behind the ears, or to the temples, or by cups to the back of the neck, cannot replace general bleeding, but may be used as an adjunct. If, on the contrary, the heart's impulse be weak, the pulse irregular, and rattling in the trachea has already begun, we may be almost certain that bleeding would only do harm, since the action of the heart, which is already weakened, would be still more impaired, and the amount of arterial blood

going to the brain would be thus still more decreased. When the latter state occurs, the symptomatic indications require just the contrary treatment, in spite of the original disease being the same, and being due to the same causes. We must strive with all our skill, by the use of stimulants, to prevent paralysis of the heart. If we cannot give wine, ether, musk, &c., internally, we should apply large sinapisms to the chest and calves of the legs, rub the skin vigorously, and sprinkle the breast with cold water. In all cases the bowels should be freely moved, either by a dose of calomel or croton oil, or by an aperient enema."

If you see the patient after he has recovered from his unconsciousness, you should content yourself with keeping him at rest, covering the head with an ice-bag or cold compress, and maintaining a free action of the bowels.

When the fit is believed to have resulted from thrombosis, the patient's head and shoulders should be somewhat raised, and stimulants, such as alcohol, ammonia, or ether, should be prescribed. Bloodletting must not be practised. The bowels should be opened by an aperient, but violent purgatives ought to be avoided. If the heart's action be feeble or irregular moderate doses of digitalis may be given, and in most cases diuretics, such as the acetate of potassium, may be combined with it (F. 90). As soon as consciousness has returned, liquid food, in the form of milk or beef tea, should be given frequently, and every effort made to maintain the strength of the patient. Since in the majority of cases the plugging of the vessel has arisen from syphilitic disease of its inner coat, iodide of potassium should be administered either by the mouth or in the form of an enema, while mercurial ointment is rubbed into the thighs and armpits. When recovery takes place tonics may be administered, such as cinchona (F. 218), acids (F. 215), or quinine.

In cases of apoplexy great care must be taken that the bladder is properly emptied; and if this is found not to be the case, a catheter should be passed regularly. All the parts of the body exposed to pressure ought to be examined frequently, and if the skin appears to be inflamed, spirit should be applied two or three times a day, and the patient laid upon a water pillow or on cotton wool, to prevent the formation of bedsores.

He should be confined strictly to bed for two or three weeks in very slight cases, or for four or six weeks at least in those of a more severe character.

In the fever that is apt to follow an attack of apoplexy, and which depends on inflammation of the cerebral substance in the vicinity of the injured part, you may apply leeches to the temples and ice or cold water cloths to the head, if the pulse is firm and the skin hot. When there is feebleness of the heart's action, dry cupping, or a blister to the neck is more efficacious. In either case the bowels must be kept freely open, and the diet should consist of liquid food. It is the custom with some practitioners to prescribe mercury or iodine after an attack of hemiplegia, under the idea that absorption of the clot will be thereby promoted ; but no beneficial results seem to follow such treatment.

In the paralysis following an attack of apoplexy, you may produce good effects by frictions and galvanism, as these measures serve to maintain the nutrition of the muscles. Strychnine, given internally, seems to be of little use, but Dr. Hammond has recommended its subcutaneous injection into the muscles.

As an attack of apoplexy tends to render a recurrence probable, by the changes it produces in the circulation of the brain, you must insist upon your patient avoiding all excitement of body or mind. He should be strictly temperate in eating, and not indulge in alcoholic stimulants, unless they are required for some special purpose.

Amer.—In cases of hæmorrhage venesection should only be practised when the face is flushed, and the pulse full and strong. One or two drops of croton oil may be given as an active aperient. The head should be raised and kept cool. In cerebral embolism depletion must not be employed, but stimulants may be required. In thrombosis venesection must not be used, and stimulants are often necessary. In cases of apoplexy the patient may die from fluid collecting in the pharynx. It is wise, therefore, to let him rest on one side. The paralysis may be relieved, after the apoplectic symptoms have passed away, by the employment of shampooing and the faradic battery.

Fr.—Bleeding is only of use in robust persons where the pulse is full, large, and hard, and the impulse of the heart is strong. In less robust

persons some advise that a small quantity of blood be withdrawn, and its effects watched before a larger quantity is removed. In feeble subjects it is better to use sinapisms. Purgative enemata should be given.

Germ.—An ice-bag may be applied to the head. In robust individuals, if there is deep congestion of the face, and a slow, full pulse, venesection may be performed. The bowels should be freely opened. To relieve the hemiplegia left by the attack, electricity may be used, "the current being made to pass transversely through the head, with as much regard as possible to the position of the hæmorrhagic focus; the current should be feeble, and the application should occupy two or three minutes" (Strümpell).

Abscess of the Brain.

Prognosis.—This may occur as an acute or chronic affection. It is generally the result of an accident to the skull, of disease of the internal ear or the bones of the nose, or of pyæmia. In the acute form it runs a rapidly fatal course, and the encephalitis producing the abscess may so closely simulate inflammation of the cerebral membranes, that it may be impossible to distinguish between them. In chronic cases the pus may become walled in by fibrous tissue, and the patient may live for many months, or even for years.

Treatment.—This must of necessity be unsatisfactory, because we are usually unable to diagnose the existence of the encephalitis until an abscess has been formed. In traumatic cases you may bleed from the arm, use leeches to the temples or behind the ears, and apply an ice-bag to the head, at the same time that the bowels are kept in free action by saline or other aperients. Calomel, given to the extent of affecting the gums, was formerly recommended, and is still employed by many practitioners. In pyæmic cases we must content ourselves with prescribing quinine (F. 215), acids (F. 209), alcoholic and other stimulants, together with a nutritious diet. When the abscess has arisen from disease of the ear, which is the most general cause, recourse must be had to hot poultices and fomentations, so as to encourage the escape of the discharge, at the same time that we support the general strength, and relieve pain by opium.

The treatment of chronic abscess is the same as that of chronic softening of the brain.

Of late years, abscess of the brain has been successfully treated by trephining the skull and giving a vent to the pus enclosed in the cerebral substance. Traumatic cases are best fitted for such treatment, as the presence of pus and its exact situation are in them more capable of diagnosis; but surgical operations have also been applied to cases arising from disease of the ear. The cerebral symptoms are often slight, "consisting only in an inequality of the pupils, vomiting, and optic neuritis of considerable intensity and very rapid development." "Abscess from ear disease is twice as frequent in the cerebrum as in the cerebellum. In the former it is usually in the temporo-sphenoidal lobe, occasionally in the frontal, rarely in the occipital, and still more rarely in the parietal. Abscess in the cerebellum is almost invariably in the hemisphere."* The precise seat for trephining over the second temporal convolution is at a point one inch and a quarter behind the external auditory meatus, and the same distance above its level.

SECTION III.

Chronic Diseases of the Brain.

Cerebral Anæmia.

This is often assumed to be present when there are symptoms of cerebral disturbance for which no other cause can be assigned, accompanied by a feeble state of the vascular system. It presents itself in general anæmia, after hæmorrhages, and in many acute and chronic maladies of an exhausting nature. Some authors describe as cerebral anæmia what others term "*nervous exhaustion.*" In this condition the patient has a deficiency of memory, of power of attention, and of mental concentration. He

* 'A Manual of Diseases of the Nervous System,' by Dr. Gowers, F.R.S.

has lost his accustomed energy and resolution, and is more feeble than formerly, both in body and mind; he complains of pains and numbness in different parts of the body, of palpitation, and a dread of sudden death; he suffers from headache, giddiness, imperfection of sight, and almost always from flatulence, loss of appetite, and other symptoms of feeble digestion. Such cases are very tedious, and the patient is generally so vacillating that it is difficult to persuade him to persist in any settled line of treatment.

Treatment.—**A.** The commonest cause of nervous exhaustion is an undue excitement of the brain, arising from grief, long-continued anxiety, or some other mental strain. It is most difficult to divert the thoughts of the patient from himself and his own sensations. This is best effected by change of air and occupation. In other cases the cause of the nervous exhaustion is irritation of some sensitive organ. Thus, amongst females, you often discover uterine derangements; in men, over-indulgence in venereal excitement, or frequent seminal emissions, may give rise to the complaint. The cause must in any case be attended to, and, as far as possible, removed.

F. You rarely meet with a case in which the digestive organs are not deranged. The diet should be therefore carefully regulated, and it is generally necessary to restrict the amount of alcoholic beverages, for patients are apt to indulge in them to excess, in order to relieve the mental depression from which they are liable to suffer. Where there is danger that a habit of drinking may be induced, you should substitute ammonia, tincture of lavender (F. 70), or ether, for wine and brandy. The bowels are usually constipated, but you must be careful not to prescribe irritating aperients, for a single dose of cathartic medicine may undo all the good you may have effected by long and careful treatment. If the appetite be bad, or other signs of feeble digestion present themselves, quinine (F. 228) or some other bitter may be required.

C. In most cases, at any rate at first, you must direct your remedies so as to lessen the irritability of the nervous system. For this purpose you should employ sedatives, such as bromide of potassium or ammonium (F. 114), combined with tincture of hop or henbane. In order to lessen any unpleasant effects likely

to arise from the sedatives, you may add to them valerian, chloric ether, camphor, or ammonia. It is not advisable to give chloral or morphine, unless to procure sleep, as they are apt to disorder the digestion.

H. As soon as you have succeeded in lessening the undue excitability, you should attempt to increase the tone of the nervous centres. Where anæmia is present iron is most useful, either in the form of the valerianate, phosphate, or carbonate; if there is no anæmia, some preparation of zinc (F. 233) or of manganese will be found more valuable; arsenic (F. 224) and nitrate of silver are favourite remedies with some practitioners. In this and in all other states of the nervous system requiring tonics, cod-liver oil and phosphorus are of use.

Softening of the Brain.

Prognosis.—The prospect is very unfavorable, although there is no doubt that, where the amount of cerebral structure affected is very small, recovery may ensue. If the paralysis resulting from an attack of hæmorrhage does not quickly improve, ultimate restoration is improbable. As regards embolism and thrombosis the prognosis is more varied. When the person is young, and the other organs of the body are healthy, an embolus of small size may be removed, and the patient may perfectly recover. Even in thrombosis the hemiplegia may pass entirely away, although such an event is comparatively rare.

Treatment.—**A.** As, in the majority of cases, the original cause of the softening of the brain is the obstruction of an artery by an embolus or thrombus, or encephalitis that has been excited in the neighbourhood of an extravasation or new growth, we have no causal indications to direct our practice.

F. Your chief aim must be to improve the quality and increase the quantity of the blood, so that the brain may be supplied with as much nutriment as possible. The food should be nutritious, and of a digestible character; and in old persons, or where other circumstances seem to render it desirable, it is wise to allow a moderate amount of alcohol. The quantity of this, however, should be only sufficient to stimulate the circulation to a slight

extent. If there is a want of appetite, you must assist it by the administration of acids (F. 211), quinine (F. 215), calumba, or some other vegetable tonic; if the bowels are constipated let them be relieved by a mild aperient (F. 155), but do not give salines or other severe purgatives, lest they should depress the action of the heart. Iodine and mercury are often prescribed under the idea that some exudation requires to be absorbed; they should be avoided, as tending to reduce the patient's strength, whilst they exert no beneficial effect on the local disorder.

H. Where you have reason to believe that there is a considerable amount of nervous exhaustion, independent of the softening, you may do good by the use of zinc (F. 233), arsenic (F. 1), nux vomica (F. 226), and cod-liver oil. Tonics must be given, however, in small doses at first, the strength being very gradually increased, lest they unduly excite the cerebral circulation.

You may have to treat anæmia or congestion of the brain, paralysis, or sleeplessness. The first three must be combated according to the rules previously given. Sleeplessness generally arises from cerebral anæmia, and is best relieved by some light nourishment, with or without stimulants, given shortly before bedtime. If this fails, you may prescribe bromide of potassium and Indian hemp (F. 177), chloral (F. 108), sulphonal (20 grs.), small doses of morphine or paraldehyde (30 to 60 mins.).

Multiple Sclerosis of the Brain.

Prognosis.—The prospect in such cases is most unfavorable, the symptoms usually increasing in severity as time goes on. In some there is, however, an apparent arrest of the disease for a considerable period, and in such the duration of life may be greatly prolonged. Where the nerves of the medulla oblongata are implicated, there is great danger, especially when the power of swallowing is affected. The disease is very apt to advance quickly during pregnancy and after parturition.

Treatment.—Most authors recommend that the patient's strength should be supported by tonics, such as quinine (F. 215) and other bitters, along with a nutritious diet. Iron (F. 201), strychnine, or zinc (F. 233) may be employed, with or without cod-liver oil, if you detect any evidence of nervous exhaustion. The

employment of electricity has seldom led to any useful results. Dr. Hammond advises that the patient should be treated with chloride of barium, along with tincture of hyoscyamus. He states that such remedies seldom fail to relieve the tremor. Other practitioners have recommended the nitrate of silver, phosphorus, and cod-liver oil, but no drug has been proved to exercise any decided effect upon the disease.

Cerebral Tumours.

Prognosis.—The prognosis is unfavorable, inasmuch as we have no means that will remove a new growth, or, except in certain cases, prevent its increase. Scrofulous tumours occur chiefly in children, they generally grow slowly, and may be accompanied by tubercular disease of other organs. They are occasionally arrested by treatment, and the symptoms arising from them lessen or disappear. Syphilitic tumours, although productive of great suffering, are less dangerous if the patient be judiciously treated, but the symptoms are very apt to recur from time to time. In some cases of glioma the disease progresses slowly, in others it is rapid; but you can only estimate the probable duration by carefully watching the symptoms. We have no more power of arresting cancer of the brain than of curing a malignant tumour in any other part of the body; the prospect is therefore hopeless whenever you feel tolerably sure as to your diagnosis.

Treatment.—**A.** Where you suspect the tumour to be of a scrofulous nature, you must prescribe iodides (F. 8), iron, cod-liver oil, or other tonics. At the same time you should attempt to improve the general health by a carefully regulated but nutritious diet, a residence at the sea-side, and exercise in the open air. If you suspect syphilis, treat the case with iodides (F. 11), mercury, or both combined. Mercury is most useful in the more recent cases, and may be exhibited in the form of the perchloride, or calomel; or the mercurial ointment may be rubbed into the armpits and groins night and morning until soreness of the gums is produced. The iodide of potassium may be given at the same time that the inunction is employed.

Large doses of the iodide are usually necessary ; five grains may be prescribed at first, and the quantity gradually increased up to twenty or thirty grains three times a day. You should not hesitate to use these remedies if the symptoms are at all suspicious, even if the patient denies that he has ever had the disorder, for many persons have recovered who were suffering apparently from specific disease of the brain, but who were unaware that they had ever been affected with a primary sore. In glioma you have no causal indication, but it is generally worth while to try a course of iodide of potassium, combined with cinchona (F. 8). In cancer you can do nothing except support the general health ; iodine and mercury should not be given.

F. Attention should be paid to the diet and to the excreting organs, as in all other chronic diseases ; but no amount of care in these particulars will remove a cerebral tumour, any more than it would absorb a new growth in any other structure.

The symptoms that generally require treatment are those arising from local meningitis, congestion of the brain, and neuralgia. The cerebral congestion probably results from the determination of blood to the brain produced by the growth of the tumour. It is accompanied by headache, vomiting, constipation, and a rise of temperature. The application of leeches to the temples, or the use of cupping to the neck, cold compresses or ice-bags to the head, active aperients, low diet, and rest of body and mind, afford most relief. In some cases the insertion of a seton in the neck or arm seems to obviate these attacks. When the neuralgia is severe you should use the subcutaneous injections of morphine, or the internal administration of chloral (F. 108), bromide of potassium (F. 107), or antipyrin. Some authors recommend Indian hemp, in combination with bromide of potassium, as a valuable means of relieving pain. In the convulsions which occur in cases of cerebral tumours, bromide of potassium may be given, but it is inferior in efficacy to chloral.

Considerable success has recently attended the attempts to remove cerebral tumours by surgical operations. The most favorable cases are those in which it is not malignant, not of large size, where it is situated just below the cortex, and where the symptoms are sufficiently well marked to admit of its position being determined with tolerable certainty.

Chronic Hydrocephalus.

Prognosis.—A few persons suffering from the disease have lived to an old age, but the prognosis is generally very grave.

Treatment.—The results obtained from a treatment based on the principle that a collection of fluid in the skull should be treated as other dropsical effusions, are unfavorable. Mercury and iodine have been prescribed without benefit, and purgatives and diuretics have proved equally unavailing to effect any permanent improvement. Compression of the head by straps of plaster, or by an elastic bandage, is seldom productive of much benefit, and it often adds to the distress of the patient by setting up ulceration of the scalp. The skull has been tapped, but the fluid generally collects again in a short time. If this operation is determined upon, the trocar should be introduced at the outer angle of the anterior fontanelle, and not more than an ounce of fluid should be removed at a time, an elastic bandage being applied directly after the operation.

SECTION IV.

Nervous Disorders the Seat of which is Uncertain.

Chorea.

Prognosis.—The prospect is favorable, although occasionally a case dies from loss of sleep and exhaustion. The prognosis is good in proportion to the amount of sleep that can be obtained. The disease is apt to recur, but a second is generally less severe than the first attack. When paralysis occurs, it usually disappears after a few weeks. Chorea occasionally show itself in females who are pregnant, usually about the third month; it is often very rebellious to treatment, and may require the induction of premature labour. In almost every case of chorea at an early period, the sulphocyanide of potassium will be found to be either absent or in diminished quantity in the saliva of the

patient, and the symptoms usually persist as long as this continues to be the case.*

Treatment (p. 27).—**A**. You should prohibit mental excitement, and insist upon a full amount of sleep. All causes of local irritation must be removed; if a tooth is projecting let the gums be lanced; if carious teeth are causing pain, they should be extracted. The source of irritation often exists in the bowels; when such is the case, let a dose of aperient medicine be given, and throughout all the subsequent treatment keep up a free action of the intestinal canal. This is so important, that some practitioners have relied on purgatives alone in the treatment of chorea. Do not trust to the report of the patient or his friends as to the state of the bowels, but examine the evacuations yourself. Worms occasionally appear to constitute the exciting cause, and if there be the least suspicion of their presence, you must direct the treatment so as to remove them. Chorea may be induced by imitation, so that where a person has once suffered from it, or belongs to a family that has shown a predisposition to it, he must not associate with those affected.

C. As in all other affections of the nervous system, you will have to consider the necessity of giving sedatives. When the symptoms are very urgent you must trust entirely to them, at the same time keeping your patient in bed. Chloral, the hydrate of butyl-chloral, bromide of potassium or ammonium, extract of Indian hemp, and belladonna are those in most general use. Where these fail, you must have recourse to morphine, especially where the sleep is imperfect.

Bromide of potassium is of little value in the treatment of chorea, and even morphine is inferior to chloral, which in severe cases may be given three or four times a day in moderate doses. The Calabar bean has been prescribed, but it is not much used.

Various methods have been employed to diminish the excitability of the spinal cord. Some have advised that ether should be sprayed upon the whole length of the vertebral column twice a day; and although we have seen it occasionally useful, it generally fails to lessen the movements. Others recommend the use

* In order to test for the sulphocyanide, two or three drops of the tincture of the perchloride of iron are added to the saliva, which in the normal state immediately assumes a blood-red colour.

of an ice-bag to the spine, but in slight cases it is not required; whilst in those that are severe the incessant movement of the body soon wears away the india rubber. In rare instances there is a sudden and extreme rise of the temperature, a symptom always indicative of danger. It should be treated by cold sponging followed by the ice-cradle, and if there is any evidence of acute rheumatism, cold baths and the salicylate of sodium must be given. The cold pack is of great use in such circumstances, as it reduces the temperature, at the same time that it secures a certain amount of muscular rest. We need not remind you that the thermometer should never be placed in the mouth in chorea.

D. The patient should be kept in bed so long as the motion of the limbs is excessive, as rest tends to shorten the duration of the attack. When the muscular action is general and severe, it is often a good plan to confine the body and limbs by a sheet passed across the bed and firmly secured to the bedstead. Care must be taken to prevent injury to the limbs, and all parts likely to be chafed should be protected by cotton wool and a bandage.

F. The diet should be nutritious, but easy of digestion; and alcoholic stimulants will be found useful when the patient is feeble. In severe cases the patient must be frequently fed, and, if necessary, the food must be forcibly given, as the incessant movements prevent him from making any voluntary attempt to take nourishment.

Where the appetite is defective you may prescribe acids and bitters. As a general rule, the excreting organs require regulation, and as soon as this is effected, the appetite will be restored.

H. Where the symptoms are less urgent you may prescribe nervine tonics. Practitioners vary greatly in their estimate of the value of the drugs of this class. Some recommend zinc, especially the oxide or valerianate, others arsenic, the doses being steadily and regularly increased; Trousseau preferred strychnine, Elliotson large doses of carbonate of iron. In the present day the most soluble forms of iron, such as the phosphate, valerianate, or citrate, are usually prescribed. We usually begin the treatment with three minims of the liquor arsenicalis, and increase it by one minim every three or four days, until swelling of the eyelids,

vomiting, or diarrhœa shows that the limit of the tolerance of the drug has been reached. In some cases, however, the administration of the drug in 15-minim doses three times a day appears to produce a rapid cure of the disease. Unfortunately only a small proportion of the cases exhibit a sufficient degree of tolerance toward the drug to allow this method of treatment being carried into effect. If the saliva then presents a moderate amount of the sulphocyanide, the drug is continued in a somewhat smaller dose, but if little or no colour is produced by the addition of the perchloride of iron to the saliva, the syrup of the phosphate of iron or the hypophosphite of sodium is given along with cod-liver oil.

Physicians formerly recommended the use of leeches, blisters, and setons to the back of the neck in tedious cases, but they are at present never employed.

The occurrence of endocarditis does not render the prognosis more grave, nor does it require the treatment to be altered. When acute rheumatism takes place, it is usually of a mild form, and yields readily to the salicylate of sodium.

A. *Fr.*—If anæmia is present, the carbonate or valerianate of iron may be prescribed. If the patient is rheumatic, salicylic acid is useful; when worms are suspected, appropriate remedies should be used.

Germ.—If the patient is anæmic, prescribe iron; if rheumatic, salicylic acid.

C. *Amer.*—In severe cases chloral and bromide of potassium may be given. Eserine and hyoscyamine have been used successfully, and cimicifuga and conium have been recommended.

Fr.—Bromide of potassium is of great value in bad cases, and some practitioners employ tartar emetic, but the effects of this latter drug require to be carefully watched.

H. *Amer.*—Arsenic is the tonic most to be relied on. When it fails, the subcutaneous injection of this drug has occasionally proved successful; when employed in this way, Fowler's solution should be used without the spirit of lavender. The sulphate of zinc, iron, and cod-liver oil are occasionally of value.

Fr.—Arsenic is the most useful drug; sulphate of aniline and the tincture of the Calabar bean have been recommended.

Fr.—Ether should be sprayed on the whole length of the spinal column each day for three to five minutes. A weak current of electricity may be also used to the spine.

Germ.—The most useful drugs are arsenic and bromide of potassium.

Epilepsy.

Although the danger to life during an attack is slight, death may result from accidents happening during a fit. There is not much probability of the disease ceasing spontaneously, and the chance of a perfect recovery from treatment is small. The disease commences earlier, and is less susceptible of cure, when an hereditary predisposition exists. When not hereditary, it is more favorable in young than in middle-aged or old persons. The longer it has existed, and the more frequent the attacks, the less is the chance of treatment being successful. Some are of opinion that where the fits occur only during the night, there is less probability of cure than when the patient is usually attacked in the day, but this appears to be doubtful. The effects of the disease upon the mental faculties are greatest where the attacks are most frequent and severe.

Treatment (p. 27).—**A.** In some cases where epilepsy has followed an injury to the head, and the bone of the skull has been depressed, the removal of the injured part by the trephine seems to have cured the disease; when there has been intemperance either in eating or drinking, or evidence of venereal excess or of masturbation can be discovered, such habits must be strictly forbidden. If there is a well-marked history of syphilis, iodide of potassium should be prescribed, in combination with bromide of potassium. Whenever a well-marked "aura" presents itself, you should instruct the patient, as soon as he feels it, to compress the limb above the part at which the sensation commences, by means of a handkerchief or other ligature; for although the "aura" may arise from a central cause, such as disease in the brain or its membranes, compression of the limb has been known, even in such cases, to ward off the attacks. When the "aura" commences in the upper extremity, Dr. Gowers says, "The most convenient method of applying the ligature is for the patient to double a piece of tape, and pass it round the arm above the elbow, with the ends through the loop formed by the doubled part, and brought down to the lower part of the sleeve, so as to be accessible, and easily pulled tight as soon as the warning is felt." In other cases the inhalation of nitrite of amyl occa-

sionally prevents an attack. In some instances the sensation begins in the stomach or colon, and travels upwards; under such circumstances you must pay especial attention to the digestive organs. Do not reduce the patient's strength by violent purgatives, but produce a regular action of the bowels by means of a mild electuary (F. 132) or dinner pill (F. 155). If you have reason to believe that the patient is suffering from worms, appropriate treatment must be employed to remove them.

C. The chief point in the treatment of epilepsy is the employment either of sedatives or of tonics; in almost every case the former are required. Belladonna, conium, or hyoscyamus was formerly prescribed, but of late years bromide of potassium has been more generally used. It should be given in full doses, such as twenty to thirty grains, two or three times a day, and may be combined with belladonna or Indian hemp. Some practitioners are in the habit of prescribing small doses of chloral with the bromide of potassium. Belladonna is indicated when the patient suffers from nervousness or disturbed sleep. Digitalis is of value when there is a tendency to nocturnal attacks, ten minims being given at bedtime in combination with bromide; or it may be prescribed whenever, in the intervals of the fits, the action of the heart is weak and irregular. If there is a tendency to headache, or the patient is also hysterical, the Indian hemp is of value.

In every case the treatment must be continued for a length of time, and the necessity for this should be explained to the patient. After a year's freedom from attacks the prospect of recovery is good, but the bromide treatment should be maintained for two years after the last fit. Bromide is not of much use in the "*status epilepticus*," but the nitrite of amyl sometimes succeeds in affording relief. Dr. Gowers states that he has seen most benefit in this condition from the use of chloral (fifteen grains every three or four hours), the subcutaneous injection of morphine (one tenth of a grain), and the application of ice to the spine. Morphine should not be used in an ordinary attack of epilepsy.

H. Most practitioners employ some form of nervine tonic. The preparations of zinc are chiefly given, such as the oxide, valerianate (F. 233), or sulphate; when anæmia is present you

may use iron, with or without zinc. Formerly nitrate of silver was a popular remedy, but, in addition to the chance of the patient's skin being permanently discoloured, its frequent failure has caused it to be rarely prescribed in the present day. The salts of copper have been much praised by some practitioners, but they are seldom of much use.

Blisters, setons, and moxas were also formerly much in vogue. We have seen good results from a seton in the neck, when the patient was plethoric and otherwise in good health, but, as a general rule, they are rarely of service.

A. *Amer.*—In syphilitic cases, iodide of potassium should be prescribed.

Fr.—Where an "aura" precedes the attack, blisters or cautery should be employed. If the patient is anæmic or scrofulous, appropriate treatment must be adopted.

C. *Amer.*—The bromides are the most useful, but they must be continued for a length of time; they are less successful when the patient suffers from attacks of petit mal. When the pulse is hard, they may with advantage be combined with chloral or aconite; where the action of the heart is feeble, with strychnia or digitalis. If the patient is hysterical the cannabis indica may be used. Belladonna and ergot are often prescribed. Nitrite of sodium is a dangerous remedy. In the status epilepticus, nitrite of amyl is of benefit; nitro-glycerine is to be preferred to chloroform.

Fr.—Bromide of potassium and belladonna are the drugs most to be depended on.

Germ.—Bromides are most useful, and they will be found to act better when combined (F. 309); infusion of valerian may be given along with them. Belladonna sometimes succeeds. Curare, hyoscyamine, the root of *Artemisia vulgaris*, ammonio-cupric sulphate, nitrate of silver, and arsenic are of very doubtful value. Borax (in ten or fifteen grain doses three times a day, has been successfully used where the bromides have failed.

Hydrophobia.

Prognosis.—This is always fatal, but you should bear in mind that persons of a nervous temperament may exhibit symptoms resembling this disease after being bitten by a healthy dog. Difficulty of swallowing may arise from inflammation of the

œsophagus, hysteria, and other causes in persons who have not been exposed to the poison of rabies.

Treatment (p. 27).—**A.** Although we are unable to obviate the effects of the diseased saliva after it has entered the system, we may lessen the patient's sufferings by preventing all circumstances likely to irritate him. No attempt at swallowing should be permitted as soon as the diagnosis has become clear, and the strength should be supported entirely by nutritive enemata. The room should be kept dark, all noises avoided, and as little conversation as possible permitted. If the bowels are confined, you may with advantage give a dose of calomel, or administer an aperient enema, but you should allow no medicine by the mouth.

Pasteur's method of treatment consists in injecting subcutaneously an emulsion of the spinal cord of a rabbit that had been previously infected artificially with the poison of rabies. The use of the emulsion produces no ill effects, and appears to prevent the development of the disease.

B. Formerly free venesection was recommended, and no doubt in plethoric persons some relief was thus obtained. But ordinarily it is inadmissible, because the chief indication is to support the patient's strength, and the loss of blood would increase his debility.

C. Our only hope of affording relief is in the free administration of sedatives. In the early period you may, with advantage, inject subcutaneously morphine or atropine, frequently repeating the dose. If the patient is very violent, you may administer chloroform or ether by inhalation, but this had better be avoided towards the end of the attack.

In some cases I have seen the patient soothed by frequent enemata of chloral (forty grains in each). The bromide of potassium has failed to produce any good results. The Calabar bean has been used in some cases, but with no advantage.

Tetanus.

Prognosis.—This is very unfavorable in traumatic cases, but a considerable proportion of those attacked with the rheumatic form recover. The more slowly the symptoms come on, the

greater the probability of cure. The fewer and the less severe the attacks of spasm, the more hopeful is the prospect. In traumatic cases, the number of recoveries increases in proportion to the length of time that has elapsed between the receipt of the injury and the development of the symptoms.

Treatment (p. 27).—**A.** The first point is to remove any circumstance likely to produce irritation. In traumatic cases the wound must be carefully examined, and if splinters of wood or bone are discovered, they should be at once extracted and the seat of injury excised. In all cases the patient must be confined to bed, the room must be darkened, and all noise and mental excitement carefully avoided.

Some practitioners have divided the nerves leading to the wound; some have forcibly stretched them; even amputation of the limb has been practised, so as to exclude the possibility of any irritation being maintained by the original injury. These operations are, however, seldom performed in the present day.

B. Formerly it was the custom to bleed freely, but this is now rarely employed. The bowels in all cases should be freely opened.

C. We have to depend chiefly on sedatives, and the subcutaneous injection of morphine or atropine should be used to relieve the patient's sufferings. In some cases the inhalation of ether, chloroform, or nitrite of amyl seems to have been of use, but to effect any permanent good it should be frequently repeated. Chloral and bromide of potassium may be employed when morphine is inadmissible, but the doses must be large and frequently repeated: belladonna or Indian hemp is preferred by some practitioners. Fomentations, by means of flannels wrung out of hot water and sprinkled over with belladonna and chloroform liniments, may be used to the epigastrium, to relieve the painful sensations often complained of in that region.

Recently an antitoxine has been prepared, and several observers report favorably of its action.

Mr. Curling was of opinion that tobacco is the most valuable sedative we possess in this disease. An enema of it may be employed two or three times a day, or an infusion applied to a blistered surface. Nicotine has been given subcutaneously, in

doses of half to two thirds of a drop two or three times a day. As it is slightly acid when diluted with water, we are advised to add a little potash before injecting it. It should, however, be remembered that nicotine is a very dangerous remedy. The extract of Indian hemp, in doses of one quarter of a grain to two grains every three hours, has been also recommended. The Calabar bean has been given in the shape of the extract (one eighth of a grain gradually increased). The curare or woorara has been employed in doses of one fiftieth of a grain, increased to three tenths of a grain. It is said that of twenty-two cases treated with it eight recovered, but this favorable statement has not been confirmed by other practitioners. Ice-bags to the spine have not proved of permanent benefit.

Exophthalmic Goitre.

Prognosis.—In the slighter cases, especially when they are recent, favorable results may follow treatment; but when the projection of the eyes is well marked, and accompanied by great enlargement of the thyroid and increased rapidity of the pulse, recovery is rare, and any improvement that can be looked for will be slow and imperfect. Death generally takes place from exhaustion, but in some instances it is due to tuberculosis; occasionally it occurs suddenly without apparent cause.

Treatment.—**C**. Sedatives are generally employed, and seldom fail to afford relief. The best of these is belladonna, which should be given at first in small doses, and gradually increased as the patient can bear it. In others the bromide of potassium combined with Indian hemp may be employed, but it is less useful than belladonna. Where there is great restlessness or want of sleep, sulphonal or chloral (F. 108) may be prescribed.

D. Regular exercise in the open air may be allowed in slight cases, but whenever there is much palpitation the patient should be confined to the bed or sofa. Where exercise cannot be taken the tone of the muscles should be maintained by the use of massage. Where it is possible, a residence at the sea-side or in a bracing atmosphere is advisable.

F. The diet should be nutritious, and a moderate amount of

alcohol may be allowed whenever there is much emaciation or want of appetite. Tonics are required from time to time, and of these quinine (F. 215), nux vomica (F. 211), or one of the mineral acids is best fitted for the purpose. Iron is of little use so long as the action of the heart is very excited, but it may be given with benefit as soon as the palpitation is relieved. In some cases the valerianate of zinc (F. 233) answers better than iron. When the bowels require assistance a mild aperient may be prescribed, but severe or irritating purgatives must be avoided.

H. Ergot has been prescribed, on the idea that it might cause contraction of the smaller vessels, but it is of no value. A continued galvanic current is often used to the thyroid, and in some instances benefit results. The continued application of an ice-bag, or a Leiter's coil, to the enlarged gland often reduces the size of the tumour and diminishes the rapidity of the pulse.

When severe attacks of palpitation and dyspnœa take place, relief may be obtained by the use of morphine, along with ether or chloroform, and by the application of an ice-bag to the thyroid. A *weak* galvanic current, passed through the cardiac region for twenty minutes daily, often allays palpitation and reduces the rapidity of the pulse (p. 309).

Hysteria.

Prognosis.—Hysteria is generally regarded by the public as a mere fault, and its various manifestations as symptoms that are feigned, or that could, at any rate, be prevented by the exercise of the will of the patient. In reality, the disease arises from an enfcebled state of the nervous centres ; it is often hereditary, and its symptoms are, to a great extent, beyond the control of the sufferer. It is almost confined to the female, and is most general between fifteen and thirty years of age. It is often excited by mental emotion, and is not unfrequently connected with ovarian or uterine disease; but it may be excited in those predisposed to it by slight accidents, or by the irritation of almost any organ in the body.

There is little danger to life from hysteria, but it may closely simulate various diseases, and often gives rise to great difficulty

in diagnosis. Although affections of this kind usually yield to treatment, it is rare that we can completely overcome the condition of the nervous system from which they have originated, and consequently fresh manifestations are constantly apt to present themselves. These, however, differ greatly in severity; thus, whilst the slighter forms of motor paralysis or convulsions usually yield without much difficulty to treatment, hysterical vomiting, local spasms, contractions, and the more marked cases of convulsions often prove very rebellious. The prognosis is favorable in proportion as we are able to trace the symptoms to some definite cause which we are able to lessen or remove.

It should ever be borne in mind that an hysterical person is as liable as others to disease, either of the nervous centres or other important organs; consequently a case should never be regarded as a trifling one merely because it is accompanied by hysterical symptoms.

Treatment.—**A**. You should ascertain if there is any organ, the condition of which is giving rise to the hysterical symptoms. In many the uterus or the ovary is diseased, but whilst the treatment necessary to afford relief is undertaken, it is advisable to distract the patient's attention as much as possible from the affected organs.

C. Sedatives often form the most important part of the treatment of hysteria, but they should be used with great caution, lest a habit of relying upon them should be induced. Especially avoid the frequent use of hypodermic injections of morphine for the relief of any local pain, for it is better the patient should endure some suffering than that she should become a slave to the use of narcotics. The bromides are invaluable, but they should be combined with a tonic if it is necessary to continue them for any length of time. Some prefer chloral where there is much sleeplessness, but small doses of sulphonal (five to ten grains) are more useful, and less liable to lead to the habit of depending upon drugs of this kind.

F. The diet of the patient should be carefully attended to. It should consist of materials that are readily digested, and the amount of food must be sufficient in quantity for the requirements of the system. Anything that seems to produce indigestion ought to be avoided but care should be taken not to attach

undue weight to the complaints of the patient, as she often attributes to some particular article of diet the uneasy sensations arising from the disease. Where the appetite is bad, tonics may be given, such as one of the bitters (F. 207) or a mineral acid (F. 210). In most instances constipation is present, but the aperients employed to relieve it should be such as act with very little irritation. A combination of aloes and iron, with or without nux vomica (F. 158), is generally most useful. There is almost always a complaint of flatulence, which may be treated with charcoal, carbolic acid (F. 34), or creasote. In other cases the tincture of valerian, assafœtida, or galbanum may be employed. When it arises from anæmia, iron is necessary; if this is not present, the mineral acids, or the valerianate of zinc, may be required. Regular exercise in the open air, healthy employment of the body and mind, cold or sea bathing, and an occasional change of air and scene are in all cases advisable.

In extreme cases, where there is a complete loss of appetite and great emaciation, the Weir-Mitchell treatment may be adopted. This consists in the removal of the patient from her friends, only the nurses in attendance being permitted to be with her. She is confined strictly to bed, and frequently fed with food of a nutritious character, whilst the muscles of the body are stimulated by careful and regular shampooing and the use of electricity. This method succeeds in very many intractable cases, but we have often known the symptoms return shortly after the treatment has been intermitted, and we have seen some who, along with hysterical symptoms, were suffering from organic disease, in whom it has acted most injuriously.

For the treatment of hysterical vomiting see p. 156; hysterical aphonia, see p. 74; hysterical paralysis, see p. 307.

Catalepsy.

Prognosis.—There is little danger to life, but the attacks are apt to recur. The most favorable cases are those in which there is a history of malaria, or where the affection has taken place, in a person previously healthy, after an accident or severe mental shock.

Treatment.—In order to cut short an attack, ammonia may be applied to the nostrils or the cold douche employed. If these fail, a few drops of nitrite of amyl may be inhaled, or the faradic current applied to the limbs or the spine. Dr. Gowers recommends the subcutaneous injection of apomorphine ($\frac{1}{20}$ to $\frac{1}{12}$ of a grain), so as to cause vomiting.

In malarial cases, quinine and arsenic may be given in the intervals of the attacks ; in others, iron, quinine, or valerianate of zinc may be prescribed.

CHAPTER XVI.

DISEASES OF THE SPINAL CORD.

SECTION I.

Acute Diseases of the Spinal Cord.

Congestion and Hæmorrhage.

Prognosis.—These cases are accompanied with great danger whenever embarrassment of the breathing indicates an affection of the upper part of the cord. If the lower limbs are alone paralysed the prospect is more hopeful, as the muscles sometimes slowly regain their power, although, as a general rule, this is not the case.

Treatment (p. 16).—**A.** If you have reason to suspect the patient to have been affected with syphilis, mercury or iodide of potassium should be used.

B. You are advised by some authors to apply a number of leeches to the spine or to the anus, but as there is seldom much pain, such a plan of treatment is not generally followed. Dry cupping over the spine may be freely practised in all cases. The bowels should be purged, and for this purpose saline aperients (F. 149) are to be preferred, the drain upon the vascular system being maintained for some time. The application of ice-bags to the spine is recommended by most authors; they may be used in the early stage of the complaint, and whenever the symptoms are of a threatening character; but after a few days hot poultices are more grateful to the patient. Large doses of ergot (one drachm of the liquid extract) are

prescribed, or ergotine is used subcutaneously, by some practitioners, on the supposition that the blood-vessels of the cord may be thus contracted. Belladonna should be avoided, lest dilatation of the smaller arteries and capillaries be produced, but Dr. Hammond regards it as useful when the sphincters are affected.

D. The patient must be kept in the recumbent position, and some authors advise that the legs should be placed on a lower level than the body, so as to facilitate the flow of the blood from the spinal veins.

E. The diet in the early stage should consist of beef-tea, milk, and farinaceous food; no alcoholic stimulants should be permitted unless signs of depression show themselves.

Spinal Meningitis.

Prognosis.—Most of the cases of idiopathic spinal meningitis recorded by authors are of a doubtful character. The complaint is usually the result of disease of the vertebræ, or it occurs in persons reduced in health by some severe illness. Although cases of recovery are recorded, death is the ordinary termination, usually within six days after the commencement of the attack. The danger is in proportion to the height of the temperature, the acuteness of the symptoms, and the degree of paralysis.

Treatment.—Perfect rest in bed must be insisted on, and the prone position is often of advantage, as it tends to relieve the congestion of the vessels. Spinal meningitis set up in the course of other diseases usually escapes notice during life. Where it is suspected, you should prescribe full doses of opium together with the application of hot poultices and fomentations to the spine, and insist upon perfect rest. Some authors recommend the employment of leeches or cupping to the spine, and the use of mercury so as as produce ptyalism.

Morphine is often required to relieve the severity of the pain; and where sleeplessness is present, bromide of potassium or chloral may be given. When the acute stage has passed away, blisters and other forms of counter-irritation may be employed.

Acute Myelitis.

Prognosis.—The danger depends on the severity of the symptoms and the locality of the mischief. It is greatest when the cervical enlargement is affected, as the respiratory muscles are then liable to be paralysed; the prospect is also more grave when the lumbar enlargement is the seat of the injury than when it is confined to the dorsal region. The early occurrence of a bedsore or cystitis is a bad sign. As regards the chance of the recovery of muscular power, so long as both sensation and motion are lost, no improvement can be looked for; but if the sensibility of the skin returns, the prospect is more hopeful. The development of the spastic state does not prevent a certain amount of recovery in the power of walking.

Treatment (p. 16).—**A.** Where the attack has followed exposure to wet or cold, a hot bath and some diaphoretic medicine may be used, but they are of little service after paralysis has taken place. Where there is a well-marked history of syphilis, mercury and iodide of potassium should be given in repeated doses.

B. When the patient is robust, blood may be withdrawn by means of cupping, or leeches applied over the spine; but where he is weak and feeble, it will be sufficient to use dry cupping. The ice-bag has been recommended, but hot fomentations and poultices are usually more agreeable to the patient. Ergot in large doses has been recommended in the early stage, but it is seldom productive of much benefit.

C. In case of sleeplessness or restlessness, morphine, chloral, or sulphonal may be required. The greatest care must be taken to prevent bedsores and cystitis. The skin of the back must be watched daily, and the most perfect cleanliness insisted on. Pressure must be prevented by frequently changing the position of the patient, by the use of pillows or cotton wool, or by the employment of a water-pillow. When there is retention of urine, the bladder should be emptied by the catheter; and if there is incontinence, a bed-urinal may be employed, or if this cannot be used, boracic absorbent cotton wool should be applied, and changed as often as it becomes wet.

D. The patient must be confined to bed, and remain in the recumbent position as long as there are any acute symptoms.

E. At first the diet should consist of liquids.

When the more acute symptoms have subsided, tonics should be prescribed and a more nutritious diet allowed. So long as the muscles retain their firmness, or there is an increase in the knee-jerks, it is better to avoid the use of galvanism; but this may be applied to the limbs as soon as all acute symptoms have passed away. Great care must be taken to prevent, by proper positions or the use of supports, the contractions of the limbs that are apt to take place.

SECTION II.

Chronic Diseases of the Spinal Cord.

Chronic Spinal Meningitis.

Prognosis.—All forms are dangerous to life, but cases occasionally occur in which the symptoms gradually disappear. The most favorable are those following injuries and those arising from syphilis.

Treatment (p. 30).—**A.** When there is a history of syphilis, mercury or iodide of potassium should be prescribed.

C. On account of the severe pain with which the disease is generally accompanied, sedatives must be employed to afford relief. Morphine may be given internally or subcutaneously; and when there is an objection to its use, bromide of potassium, chloral, Indian hemp, or some other sedative may be substituted. As it is usually necessary to continue the sedative treatment for a length of time, it is advisable occasionally to change the drug selected.

D. Perfect rest is necessary, and it is generally requisite to confine the patient for many months to the recumbent position. He should not be allowed to leave his couch so long as severe pain follows the effort at exertion.

H. Great relief is often afforded by counter-irritation applied to the spine. Blisters and stimulating liniments may be used; or, if the pains are severe, the thermic hammer or the actual cautery may be employed. Wasting of the muscles requires the application of galvanism or of massage.

Chronic Myelitis.

Prognosis.—The prospect of perfect recovery is small, but in some instances the inflammation seems to be arrested, so that the symptoms do not increase. The more acute the disease and the sooner the patient is subjected to treatment, the better is the prospect of improvement. In paraplegia from pressure, as in curvature of the spine, there is greater hope of a favorable termination, as some recover the power of their limbs after the paralysis has lasted for a considerable period.

Treatment (p. 30).—**D.** Rest is often useful at the commencement of the treatment, but in most cases the patient should not be confined to bed for any length of time. Over-exertion either of body or mind must be avoided. In paraplegia from pressure, he should be restricted to his bed for a considerable period.

F. A nutritious diet should be prescribed, and if the patient is feeble or anæmic, alcoholic stimulants may be allowed. The tonics most generally useful are iron, quinine, arsenic, or the mineral acids, but strychnine had better be avoided. A sea voyage is often recommended in the more chronic cases. In paraplegia from pressure, iron and cod-liver oil are to be preferred.

H. Counter-irritation is generally of service, such as repeated blistering, the thermic hammer, or the use of the actual cautery. The daily application of hot water to the spine is recommended by some practitioners, whilst others employ brine or mud-baths.

Multiple Neuritis.

This is apt to be confounded with chronic myelitis, although it differs from it both as regards prognosis and treatment. It affects both sexes, but females who are sufferers from chronic alcoholism are most liable to it. The first symptom is usually a loss of sensation in the extremities, accompanied by a dull pain in the course of the nerves, which increases in severity as time goes on. There is also tenderness on pressure over the nerves and muscles of the affected parts, accompanied or followed by loss of power, so that the hands drop, as in poisoning by lead, and the patient is unable to support the weight of her body. The knee-jerks are lost, but the sphincters are unaffected.

Prognosis.—Danger to life only occurs in rare cases, when the respiratory muscles are implicated. Usually recovery takes place in three to six months, although in some, nine to twelve months are required for the muscles to regain their power.

Treatment (p. 30).—**A.** As the disease is generally the result of alcoholism, all wines and spirits must be forbidden; or, if their use is necessary, the quantity should be restricted to the smallest amount that is possible. In the early stages, if the patient has been exposed to cold, the salicylate of sodium, or some diaphoretic medicine may be given, and the bowels should be freely opened if the attack has been preceded by constipation.

C. Where the pain is excessive, morphine, bromide of potassium, or chloral may be prescribed, but sedatives should be given with caution, as patients who have accustomed themselves to alcohol are apt to abuse remedies of this nature after their recovery. It is better to trust, as much as possible, to hot fomentations, anodyne liniments, or plasters placed over the painful parts.

D. The patient must be confined to bed as long as there is much pain or tenderness of the limbs.

F. The food should be nutritious and easy of digestion, and one of the vegetable bitters along with a mineral acid may be prescribed if the appetite is defective.

H. In the early stage relief is often afforded by gentle

rubbing, which may be applied more frequently and systematically as the muscular tenderness subsides. At this period of the case it is better to avoid the use of the galvanic current, which, however, may be employed with advantage afterwards to any of the muscles that present indications of degeneration (p. 305).

Locomotor Ataxia.

Prognosis.—The prospect of complete recovery is very unfavorable, and especially when the disease has been of long duration. It is not, however, uncommon for the progress of the complaint to be for a time arrested, although the symptoms may afterwards again increase.

Treatment.—**A.** When you find marked indications of any general disorder, you ought to direct your treatment for its removal. Thus, in case the patient has suffered severely from constitutional syphilis, you should prescribe perchloride of mercury (F. 4), or iodide of potassium (F. 8); or if there be also anæmia, you may give iodide of iron. The iodide should be given in full doses, but energetic mercurial treatment must be avoided, especially when there is optic atrophy. The good effects, however, of a course of iodide of potassium or mercury are often very much less than might have been expected. If the patient has been liable to gout or rheumatism, let your prescriptions be framed so as to relieve these affections.

C. Belladonna or extract of Indian hemp (F. 177) may be employed where there is much pain, but when these are ineffectual, morphine should be injected subcutaneously.

D. All depressing influences must be avoided; the patient should be induced to take regular exercise in the more chronic cases, but fatigue or over-exertion must be prohibited. Sexual excesses are especially to be condemned. When the pains are severe it is better to confine him to the recumbent position. A sea voyage is often recommended in the chronic cases, so that the patient may be, as much as possible, in the open air without being exposed to fatigue.

F. The diet should be carefully regulated, and the functions of the bowels and kidneys attended to; in most cases there is

no complaint of any abnormal state of the digestion or assimilation.

H. Innumerable remedies have been proposed for the treatment of locomotor ataxia, but none of them seem very efficacious. When the disease is progressing, tonics are of most service, such as arsenic, iron, quinine, strychnine, or nitrate of silver. The nitrate of silver, which formerly enjoyed a high reputation in this disorder, is now rarely used, as it is inferior to arsenic. It may be given in doses of $\frac{1}{6}$ to $\frac{1}{3}$ gr. two or three times a day, but it should not be continued for more than two months; and it is wise to discontinue it every three weeks, so as to avoid the danger of its blackening the skin. In chronic cases, you may give cod-liver oil and preparations of phosphorus with advantage. Ergot has been recommended in large doses, and in some instances it seems to be of value.

Slight gastric crises may be relieved by the use of a mustard blister applied to the nape of the neck and to the epigastrium at the same time, but severe cases require the subcutaneous use of morphine. In weakness of the bladder nux vomica is useful; belladonna may be given where there is nocturnal incontinence. Laryngeal spasms are best treated by the inhalation of nitrite of amyl. Electricity has been used to the spine and to the limbs, but without much benefit. Stretching of the sciatic nerve has been strongly recommended as a means of relieving the pains and improving the muscular co-ordination, but it has rarely produced any permanent benefit. The treatment by suspension is seldom of any value.

A. *Amer.*—In syphilitic cases use mercury or iodide of potassium; optic nerve atrophy is generally considered a contra-indication to the employment of mercury.

Germ.—Where there is a syphilitic history, mercury and iodine should be given for a long period.

H. *Amer.*—Ergot has been recommended. The nitrate of silver, chloride of gold, and chloride of barium seem to be of little value. Warm baths are often useful. The faradic brush frequently relieves the pains; and if not, morphia must be given subcutaneously.

Fr.—The best means of relieving pain is to administer belladonna or give atropine subcutaneously. Codeia is frequently useful. Neither the iodide of potassium, nitrate of silver, turpentine, nor phosphorus is of much value.

Germ.—Erb recommends "placing the medium-sized kathode in the vicinity of the sympathetic, and the large anode close to the spinous processes on the other side of the vertebral column, moving it at intervals from above downwards. This procedure should be continued for about four or five minutes on each side." (Strümpell.)

Primary Spastic Paraplegia.

The danger to life is not great, but there is rarely much improvement effected by treatment in the condition of the limbs.

Treatment.—This is the same as in locomotor ataxia. Strychnine should not be given, as it is apt to increase the spasm. Galvanism must be avoided, as being apt to increase the irritability of the cord. Systematic rubbing is of value, and may be combined with the use of the Turkish bath.

Infantile Paralysis.

Prognosis.—When a whole limb is affected the prognosis is unfavorable, in proportion to the length of time the paralysis has existed. If improvement has not occurred within six months after the appearance of the complaint, or if the affected limb be much reduced in size, change for the better is not to be looked for. Dr. Gowers states, "Whatever muscles at the end of a week or ten days have lost faradic irritability will certainly waste, and remain for a long time paralysed. On the other hand, if there is no loss of irritability at the end of ten days, but it is apparent at the end of a fortnight or three weeks, the wasting will be slighter in degree, and considerable ultimate recovery may be confidently looked for, even in the most affected part. Where there is no loss of irritability, the paralysis will pass away in the course of a few weeks, or, at most, of a few months. Where irritability is lost early the wasting will be rapid and great, the paralysis will last for one or several years, and it is unlikely that perfect recovery will take place." There is little danger to life, although death may occur in the onset from paralysis of the muscles of respiration.

Treatment (p. 30).—During the early stage you must remove any irritation, such as inflammation of the gums from the pressure of the teeth, worms in the intestinal canal, or constipation.

B. The bowels should be purged, and a free evacuation maintained. Hot poultices and fomentations may be applied to the spine, but leeching or other means of depletion is seldom required.

F. In the chronic stage, your efforts must be directed to improve the general health of the child by means of iron, quinine, strychnine, cod-liver oil, and other tonics. Residence at the sea-side, bathing in the sea, and other means of invigorating the constitution should be resorted to.

H. In order to maintain the power of the affected muscles, electricity should be steadily and perseveringly applied (p. 301).

Frictions and shampooing may be also used, and the child should be encouraged to exercise the affected limbs by means of games, india-rubber expanders, and go-carts, or by attempting to walk whilst supported by straps from the hands of its nurse. Great care must be taken to avoid the contractions that are apt to follow the paralysis of certain groups of muscles. The patient should not be allowed to sit up until his back has regained sufficient strength. It may be necessary to divide tendons and to use proper supports to prevent deformities.

Progressive Muscular Atrophy.

Prognosis.—This disease, when only partial, may be arrested in its early stage, and, even when general, it may not proceed to a fatal termination. Of twenty-eight cases collected by Sir William Roberts, the mean duration was thirty-eight months. Of these, four ended in recovery with a mean duration of fourteen months, thirteen in permanent arrest with a mean duration of twenty-seven months, and eleven died with a mean duration of more than five years. The progress of the malady is rarely at a uniform rate; it usually seems to cease for a while with the destruction of the implicated muscles, and to recommence its ravages after a more or less lengthened interval.

Treatment.—**A.** If any symptoms of constitutional syphilis can be discovered you may use mercury (F. 4) or iodide of potassium (F. 9). There are rarely any other causal indications to direct your treatment.

F. If you can detect any imperfection in the action of the secreting or excreting organs you must attempt to improve their condition. Tonics are usually given, such as iron (F. 201), zinc (F. 232), or strychnine (F. 228).

H. Most writers agree in recommending the use of electricity. It should be employed regularly and perseveringly, and each muscle that is affected should be in turn submitted to its action. Sir William Roberts advises that no sitting should exceed ten to fifteen minutes, and that rarely more than one minute should be allotted to each muscle (p. 301).

For the secondary pains the subcutaneous use of morphine is most beneficial, and in severe cases it may be employed regularly once or twice a day.

Paralysis Agitans.

Prognosis.—Cases occurring in early life are occasionally cured, but when it attacks a patient of advanced age it generally resists all attempts to remove it. If the tremor is confined to one muscle, or group of muscles, for a length of time, we may hope it will not extend. In the incurable cases the course is very slow, and the disease often exercises little effect on the general health.

Treatment (p. 27).—**F.** The health must be improved by means of good diet, a moderate amount of alcoholic stimulants, and, if possible, by change of air and scene. Any depressing circumstances, or severe excitement of the mind or body, tend to increase the tremors.

H. In some instances arsenic and cod-liver oil have proved exceedingly useful, more especially where the disease was of long continuance. In the more recent cases valerianate of zinc (F. 233), carbonate of iron, and strychnine (F. 102) succeed best. Some writers report favorably of the testicular extract (Brown-Scquard) in the treatment of this disease.

Various sedatives have been employed. The Calabar bean has been tried unsuccessfully; the inhalation of chloroform appears to check the movements for a time, but they return as soon as the effects of the drug have passed away. The tincture of hyoscyamus, in half-drachm doses, has been useful in some cases, and Indian hemp has occasionally proved of service. Both the continuous and the interrupted galvanic current have been frequently tried, but they seldom produce any permanent benefit.

Writer's Cramp.

Prognosis.—In recent cases, and where rest of the affected muscles can be obtained, benefit may be looked for; but in those that are of long standing, and where the patient is obliged to continue his occupation, little hope of a cure can be expected. Even when the patients have taught themselves to write with the left hand, its muscles have been sometimes attacked by the disorder.

Treatment (p. 27).—**A.** Perfect rest is essential. In slight and recent cases it may be sufficient to forbid all writing for two months, but in those that are more chronic, rest for six months is requisite. If this cannot be obtained, the use of a thick cork penholder, and of very soft pens, may be recommended. The application of a band of sticking-plaster, or of an elastic bandage to the wrist, has occasionally afforded relief.

F. The diet should be regulated, and any symptoms of dyspepsia corrected. Tonics, such as iron, quinine, or strychnine, may be prescribed when there appears to be a necessity for them.

H. Electricity has been employed as a means of strengthening the muscles. The continuous current is generally recommended, although some have applied faradisation successfully (p. 308). The use of liniments, whether stimulating or sedative, usually fails to produce any good effects. The subcutaneous injection of morphine, atropine, and arsenic has hitherto proved valueless.

Metallic Tremors.

Prognosis.—These arise from the inhalation of mercury or lead. The prognosis depends upon the length of time during which the patient has been exposed to the metal, and upon the amount of the paralysis.

Treatment (p. 27).—**A.** Of course the first point is to remove the patient from his occupation, and to eliminate, as far as possible, the poisonous material by means of iodide of potassium (F. 8), sulphur-baths, or diuretics (F. 90). When the complaint has arisen from mercury common salt is useful.

F. The strength should be supported by tonics, such as zinc, iron, or quinine, by a liberal diet, and a moderate amount of alcoholic stimulants.

H. The local application of electricity is the most successful means of restoring strength to the affected muscles (p. 306).

CHAPTER XVII.

FEVERS.

In health the temperature of the body is maintained at an uniform standard, although the activity of the processes engaged in the production of heat must be constantly varying; but in disease the equilibrium is often disturbed, and the temperature may rise many degrees above the normal point. The condition which is accompanied by an increase of heat is termed fever, and it may result from some local inflammation, or from a general affection of the system, such as measles or scarlatina. In either case the thermometer enables us to measure the exact amount of heat present in the part of the body to which we apply it, and hence the value of this method of investigation.

An elevated temperature is by no means the only symptom of the febrile state; almost every structure shows signs of functional derangement. The action of the heart is increased, the breathing becomes more rapid, as it is necessary that a greater volume of air should be brought into contact with the blood when driven more quickly through the lungs; the nervous system sympathises with these altered conditions, and muscular feebleness, restlessness, want of sleep, and in some cases delirium, show themselves. The digestion is disturbed, the appetite lessens, the tongue becomes foul and clammy, thirst is complained of, and the bowels are confined. The excretions are almost always diminished, the amount of water eliminated is greatly decreased, and we consequently find the skin dry and the urine scanty and high-coloured.

But although the thermometer is the best means of measuring the amount of fever, you must always take into consideration the other circumstances of a case before deciding as to its nature. In children, for instance, the temperature is often in-

creased suddenly by very trivial causes, and in old persons you may have great danger, even when the heat of the skin is but little elevated. On the other hand, there is no doubt that all high temperatures are dangerous. This probably arises from the increased heat lessening the vitality of the blood and tissues, for it is found that a high temperature produces granular degeneration of the heart and other muscular structures, as well as alterations in the cells of the various secreting organs. In any case of fever, therefore, although we may be unable to put a stop to the cause producing it, we are called upon to moderate the excess of temperature, and thus to prevent its injurious action upon the various organs of the body.

Different remedies have been employed to lessen the amount of the heat in fever. In typhoid, hæmorrhage from the bowels is not an uncommon complication, and a fall in the temperature usually follows it. You might, therefore, expect that venesection would be frequently resorted to as a febrifuge; but, in the present day, bloodletting is so badly borne that it is seldom used for this purpose, though formerly it was extensively employed, and no doubt with benefit. But, instead of the removal of blood, the withdrawal of serum from the portal system by means of aperients is a valuable method of reducing the temperature. Saline purgatives are best adapted for this purpose, and there are few cases in which they are not useful. In addition to the removal of the liquid part of the blood, they stimulate the various glands that pour their secretions into the intestinal canal, and thus expel various effete materials from the system.

As the perspiration is usually suppressed in fever, the diminished evaporation from the surface of the body assists in maintaining the elevation of temperature. Consequently the employment of diaphoretics has always been a favourite method of treatment. Acetate of ammonium, citrate of potassium, and the spirit of nitrous ether are popular remedies, and can be always employed with safety, generally with advantage. In some cases, jaborandi or the compound ipecacuanha powder is of use, but the former of these should be used with caution, as it sometimes proves very depressing.

Salicylic acid and the salicylate of sodium are valuable febrifuges, especially in acute rheumatism, but as they are apt to

produce deafness and other unpleasant symptoms, the dose should be reduced if these should present themselves. Quinine is useful in fevers, especially when they are of a low type, or when the elevation of temperature shows any tendency to periodicity. Large doses, such as ten grains, are recommended by some authors; but three or four grains, every three or four hours, are usually sufficient. Digitalis is a favourite febrifuge with some practitioners, and may be given along with quinine.

Of late years various drugs have been employed as a means of reducing the temperature in cases of fever, the most important being antifebrin, phenacetin, and antipyrin. The most powerful of these drugs is antifebrin, its antipyretic power being about twice that of phenacetin, and four times that of antipyrin. The objections to its use are that in many cases it induces cardiac depression, and in some instances cyanosis. The phenacetin does not depress the heart, and no other bad results appear to follow its use. Antipyrin is more generally employed than either of the others, as it is also useful in affording relief to neuralgic and muscular pains. The expectations that were formed on the introduction of these remedies for fever have not, however, been realised, as they are found not to lessen the duration of the disease, and the fall of temperature that follows their administration is generally only temporary.

The application of cold water to the surface of the body is the most certain means of reducing an elevated temperature, and there are various methods of employing this measure, each of which is specially adapted for particular cases. The chief of these are *sponging*, the *wet pack*, the *application of cloths wet in ice-cold water*, the *cold bath*, and the *ice-cradle*.

Sponging is carried out in the following manner:—The patient is laid on a folded blanket, and the surface of the body is carefully sponged over with tepid water, excess of fluid being avoided. In many cases it is customary to use, instead of tepid water, water of about 110° F., or what is just cool enough to allow the hand to remain in it. The sponging is continued for about ten to fifteen minutes, and the addition of a little aromatic vinegar to the water renders the application more pleasant to the patient. The advantages of this method are

that sponging over the surface of the body, especially with hot water, is always grateful to a person suffering from fever; it may be done constantly without fatiguing the patient or entailing much extra labour on the nurse; it is perfectly safe, and therefore, unlike the cold bath, it can be applied without the supervision of a medical man. The reduction of the heat of the skin amounts to about $1\frac{1}{2}^{\circ}$ to 2° F. when the temperature is taken twenty minutes after the operation. The effect, however, does not last more than an hour. In slight cases of fever, sponging, repeated every hour, usually fulfils all the indications; but where the amount of fever is excessive the heat cannot be much reduced by this method, the net result being seldom more than $\frac{1}{2}^{\circ}$, an amount too small to prove of much value (Fig. 30).

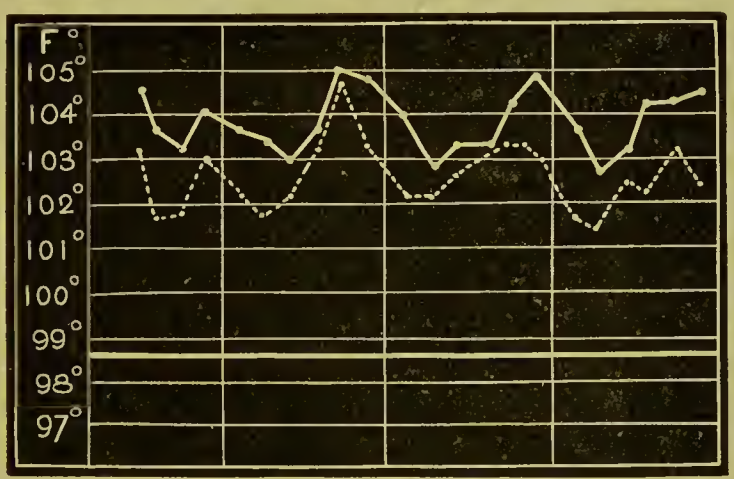


FIG. 30.—The use of sponging in acute pneumonia. The reduction of temperature is indicated by the dotted line, and was effected every four hours.

The application of the *wet pack* is carried out as follows:—A sheet is quickly wrung out of ice-cold water, and then wrapped several times around the body of the patient, enveloping him entirely, with the exception of his head; a couple of dry blankets are now applied in the same manner over the wet sheet, and over these again it is useful to wrap a mackintosh. When the first shock of the cold application has passed off, the patient experiences a pleasant sensation of warmth, and soon begins to perspire freely, the temperature of the body at the

same time being somewhat reduced. As a local application in fever, the cold pack has the following advantages :—It is exceedingly comfortable to the patient, and what is of great moment, he often falls into a refreshing sleep soon after its first application. Where violent delirium is present, entailing much muscular exertion with resulting exhaustion, the wet pack is a very useful method of mechanically controlling the muscular movements, whilst at the same time it tends to soothe the patient, and in some degree to favour the reduction of the temperature. It is a most useful application in cases of children, as it can easily be carried out by a single nurse, and as an antipyretic remedy it is of considerable utility. Its disadvantages, in case of adults, are that its antipyretic value is very limited, the average reduction of temperature being only about $\frac{1}{2}^{\circ}$ F.; and, in order to obtain this result, the pack must be changed at least every hour, in many cases every half-hour. The constant renewal disturbs and irritates the patient, whilst it entails very considerable trouble and manual labour on the attendants.

The continuous application of cloths wet with ice-cold water is recommended as a means of reducing the temperature in fever. Dr. Ringer recommends us "to dip four napkins or small towels into iced water, and wring them nearly dry, so that they may not drip and wet the bed, then apply three, one below the other from the chest, downwards. As soon as the four cloths are disposed over the chest and abdomen, re-dip and re-wring the uppermost, then the second, third, and fourth, *seriatim*, then the first again, and so on continuously. Supplementary napkins to the head, thighs, and arms will, of course, still more quickly lower the temperature; and, indeed, should be employed to a big and stout patient, since large quantities of heat have to be withdrawn through the bad conducting fatty layer beneath the skin. If the napkins are very frequently changed, this method is most efficacious, and is often highly agreeable to the patient, being in this respect preferable to the usually very disagreeable general cold bath. In some instances, even after the discontinuance of the cold cloths, the temperature steadily falls for several hours."

The use of *the cold bath* in the treatment of fevers has been more general on the Continent than in this country. Liebermeister states that "in typhoid fever, in adult patients, the

full-length cold bath of 68° Fahr. or lower is to be preferred. The same water can be used for several successive baths for the same patient; the bath-tub remains standing full, and the water representing about the temperature of the room answers the purpose without change. The duration of the bath should be about ten minutes. If prolonged much beyond that it becomes unpleasant to the patient, and may even prove a damage to him. If feeble persons are much affected by the bath, remaining cold and collapsed for a long time, the duration should be reduced to seven, or even to five minutes. A short cold bath like this will have a much better effect than a longer one of lukewarm water. Immediately after the bath the patient should have rest; he is, therefore, to be wrapped up in a dry sheet and put to bed (which may with advantage be warmed, especially at the foot), lightly covered, and given a glass of wine. In dealing with very feeble patients one may begin with baths of a higher temperature, say 75° F., although of course they will produce less effect."

A method especially to be recommended in such cases, if the surroundings permit, is that recommended by Ziemssen, of baths gradually cooled down, beginning with about 95° F., and adding cold water gradually until the temperature is reduced to 72° F. or below. These baths should be of longer duration.

"As a rule, in somewhat severe cases I have the temperature taken every two hours, day and night. Whenever the temperature in the rectum reaches 103° F., or in the axilla 102·2° F., a cold bath is given. In children, or in persons whom one has reason to suppose capable of great resistance to the influence of heat, the temperature which calls for the bath may be placed higher, say 104° F. in the rectum, or 103° F. in the axilla. In those, on the contrary, with less than the average resisting power, it may be well to employ the bath before so high a temperature has been reached, and, according to the circumstances of the case, give a shorter bath, or a warmer one, or the gradually reduced bath of Ziemssen."

"Above all things it is important for the physician to free himself from the delusion that anything essential can be accomplished by one bath or by a few baths."

"Hæmorrhage from the bowels constitutes one of the contra-

indications to the use of cold baths. The same thing, of course, holds true to a still greater degree in cases of perforation of the bowels. I have, thus far, ordered the baths to be entirely discontinued as soon as even slight hæmorrhage from the bowels occurred. An important contra-indication, however, is found in the existence of a high degree of weakness of the heart's action. When the force of the circulation is so reduced that the surface of the body is cold, while the interior is very hot, there is no hope whatever that a further cooling of the surface will make any difference to the interior."*

For cases of hyperpyrexia in which an *immediate* reduction of temperature is an imperative necessity the cold bath is especially fitted, for there is no other method at our command by which we can so quickly and so completely effect the necessary diminution in the heat of the body. Although in hyperpyrexia the bath is the only treatment to be relied upon, in cases of simple continued fever its constant use is found to be disadvantageous. A sudden reduction of the temperature of the body tends to induce shock, and syncope is not an infrequent occurrence. The bath has a disturbing influence upon the patient, the ordeal is in itself exhausting, and its frequent repetition sometimes proves injurious from this cause. The manual labour consequent on the carrying out of this treatment is very considerable, three people being always required for its performance.

To obviate these difficulties, we were led to adopt a method of reducing the temperature in fever which has been employed for many years at the London Hospital and in private practice, and which seems to us to possess the advantages of the cold bath without its drawbacks. It is generally called in the hospital the "ice-cradle," and consists of an ordinary iron surgical cradle, of sufficient width to allow the patient to move easily beneath it, and long enough to cover the whole body. In it are suspended three or four small zinc pails filled with ice; the bottoms of the pails being covered with a piece of lint, so as to prevent any condensed moisture from dripping upon the patient's body. A light coverlet is thrown over the cradle, an aperture

* Liebermeister on "Typhoid Fever," Ziemssen's 'Cyclopædia of the Practice of Medicine,' vol. i, p. 208.

being left at either end, in order to allow a free circulation of air through it. Under this the patient lies, covered with a very thin opaque gauze, whilst a hot-water bottle placed against the feet adds to his comfort, and assists in warding off any tendency to chilliness (Fig. 31). If the iron framework is not obtainable,

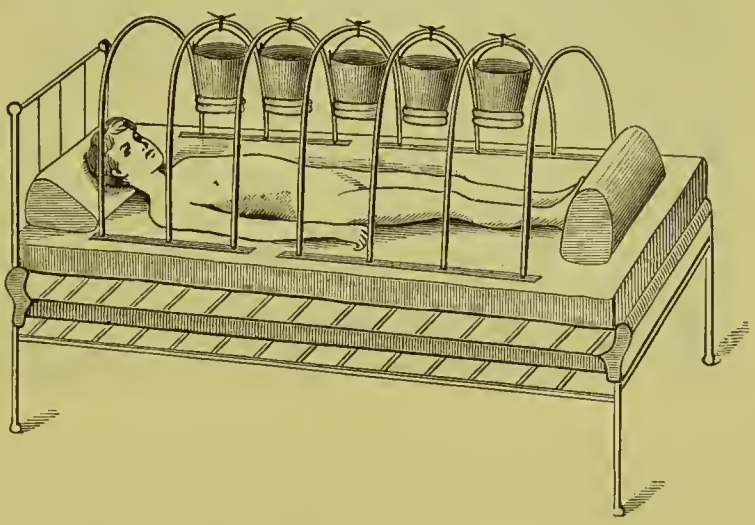


Fig. 31.—Drawing of the ice-cradle used in the treatment of fever at the London Hospital.

a good substitute can easily be made with a piece of stout wire, or a couple of wooden hoops, such as children are accustomed to play with ; a string or wire being fastened along the centre, from which the pails may be conveniently suspended.

By thus presenting to the surface of the body a constant current of partially cooled air, an elevated temperature may be steadily reduced (Fig. 32), and, what is of greater importance, can be maintained at the reduced point (Fig. 33). It might be supposed that the low temperature of the air in the cradle must exert a prejudicial influence upon any patient who is exposed to it for a length of time ; but this is not the case. In the first place, the temperature of the cradle is seldom more three or four degrees below that of the surrounding atmosphere. In many cases where ice could not be obtained, it has been found that the free circulation of air through the cradle was sufficient to induce a reduction in the temperature of the body. Although, therefore, the use of ice makes the antipyretic properties of

the cradle more pronounced, it is not indispensable, so long as a free current of air is allowed to circulate through the apparatus.

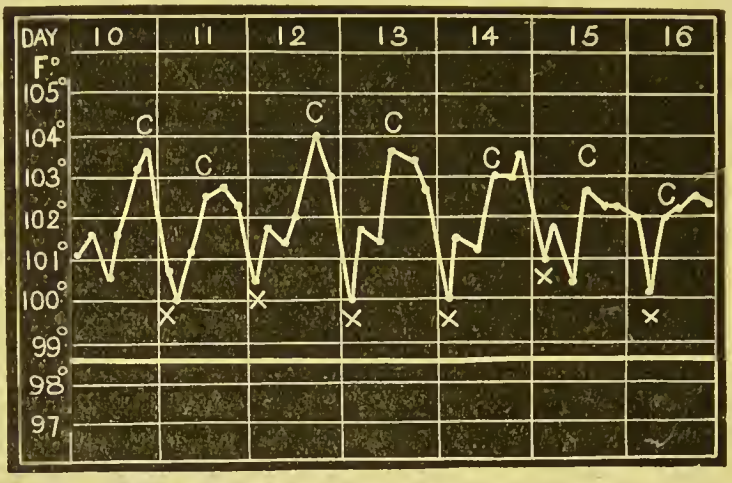


FIG. 32.—A four-hour chart in a case of typhoid fever. The ice-cradle was applied whenever the temperature reached 103°, and was removed when it fell to 100° or 101°. Hot sponging was also employed, but its temporary effect is not noticeable on the chart. The time of application is marked C; the time of removal by the cross.

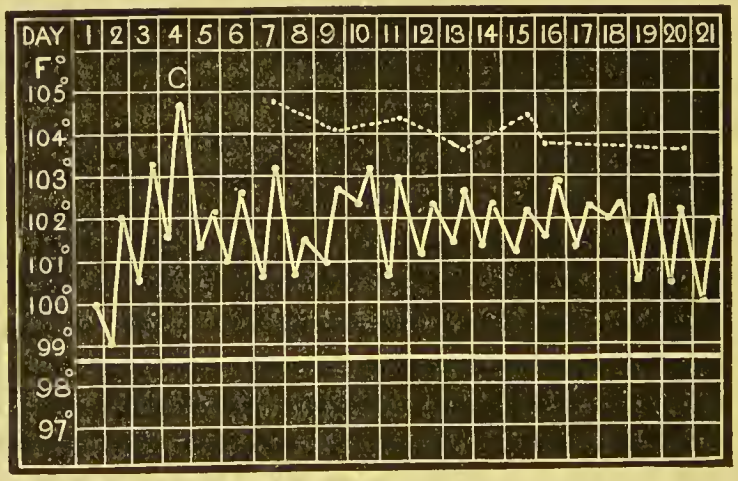


FIG. 33.—A chart of a case of typhoid fever, watched from the commencement of the illness. C denotes the commencement of the application of the ice-cradle, and the dotted line the range of temperature which was noted when the ice-cradle was removed by way of experiment.

The ice-cradle is usually employed when the temperature reaches 102·5° F. or 103° F., or in those cases in which the

temperature resists all attempts at reduction by simpler methods.

It is customary to combine with it the use of hot or cold sponging, not so much for the antipyretic value of the latter procedure, as from the fact that it is usually grateful to the feelings of the patient.

After applying the ice-cradle to a case, it is generally found that the temperature slowly begins to fall, the rate of reduction depending upon the cause and extent of the fever, the average being about 1° F. every two hours. From its use we can also roughly estimate the severity of the fever, since it is found that the greater the difficulty experienced in the reduction of the temperature, the more severe will be the general symptoms presented by the case, and the greater the danger of death.

The ice-cradle has now been used for many years at the London Hospital, and it may be said to have been uniformly successful. The advantages claimed for this method of reducing the temperature in a case of fever are the following:—Its application is easy, and the trouble involved in occasionally refilling the pails with ice, and the foot-warmer with hot water, is slight as compared with the before-mentioned methods of treatment. The temperature can not only be lessened, but it can be kept down by the continued application of the ice-cradle. Many severe cases of typhoid fever have lain beneath a cradle for a fortnight or even longer, with the happiest results, the temperature remaining constantly below 104° F.; while its efficacy was frequently demonstrated by its temporary removal, the thermometer in the axilla then rising to 105° F. or higher (see Fig. 18). The chart of such cases presents the ordinary diurnal variations, but at a lower level than would have occurred had not the fever been reduced by this method. A cradle can be easily manufactured, and, in ordinary cases, its use does away with the necessity of the employment of cold baths. In no instance has any bad symptom exhibited itself as the result of its application. Occasionally a slight amount of shivering has taken place, and the cradle has been then immediately removed, and the patient wrapped up in blankets for a time. But when the hot bottle to the feet is invariably used this symptom is but seldom met with. In acute pneumonia the

temperature is much easier of reduction than in the case of typhoid, so that it is a useful rule in pneumonia to remove the cradle when the temperature has reached 100° F., and to reapply it when it has again risen to 103° F. (Fig. 34).

The objections to the use of the cradle are twofold. In the first place, the slow rate at which the reduction of temperature is effected renders it useless in those cases of hyperpyrexia where *sudden* reduction is necessary to save life. In such the cold bath or the use of cloths wet with ice-cold water is indispensable. Secondly, the ice-cradle produces at first a certain amount of discomfort. This feeling chiefly arises from the sensation of being naked, and may be relieved by the use of a thin sheet or gauze covering, although in severe pyrexia this must be dispensed with. The patient, however, soon becomes accustomed to the application of the cradle, and much may be done, by attending to the rules laid down, to render him comfortable.

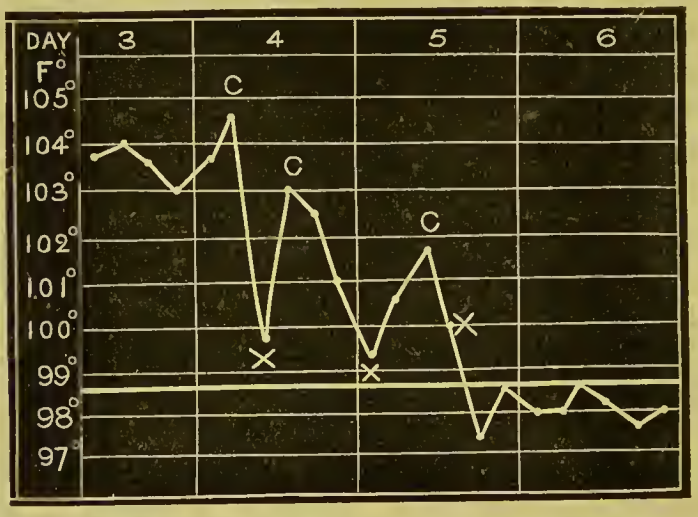


FIG. 34.—The use of the ice-cradle in acute pneumonia. The applications were made at the points C, and removed at the temperatures marked by the cross.

INFECTIOUS FEVERS.

Recent researches have shown that in this important group of diseases the febrile symptoms are the result of the introduction into the system of various micro-organisms, which are included

under the name of bacteria. These have been demonstrated in the blood or tissues in many of the infectious fevers; and in those in which their presence has not been yet distinctly proved, the similarity in the symptoms and course of the maladies leaves little doubt that they are due to this cause. The spores of the bacteria are supposed to be introduced by means of the food or air, and during their development they set up various chemical changes that act injuriously on the system. The diseases thus produced have a tendency to terminate spontaneously at certain definite periods, the micro-organisms being believed to perish, either by the exhaustion of the materials on which they exist, or by the accumulation of substances to which they have themselves given rise. Hitherto no remedy has been discovered that is capable of destroying these organisms, and we are consequently obliged to content ourselves with placing the patient in the best hygienic conditions, and with combating such complications as may present themselves. The following may be taken as general rules:

The patient should be confined to bed during the whole course of the fever, and all bodily or mental exertion strictly forbidden. The room must be maintained at an equable temperature (about 60° F.), a fire being kept burning both night and day during the colder part of the year. Free ventilation is of the utmost importance, and curtains, screens, and other furniture likely to prevent it should be removed. The room must be kept quiet and light excluded if the patient shows any tendency to mental excitement or delirium. He may partake freely of liquids, such as water, iced water, toast or barley water, or, if preferred, lemon juice well diluted, or oranges and other fruits of the same kind may be given. The food should consist of liquids; it may be given frequently, say every three or four hours, and in moderate quantities at a time; milk, milk-and-soda or seltzer water, beef-tea, chicken broth, and farinaceous food usually answer best. It is wiser to procure sleep by quiet and darkness than by drugs, but, where the patient seems to be exhausted from want of rest, small doses of chloral, bromide of potassium, henbane, or morphine may be employed.

As regards medicines, we must distinguish two conditions with which the fever may co-exist. In one the symptoms are

of moderate severity, and the strength and pulse are tolerably good. In the other there are, from the first, signs of great depression, or these may come on during the course of the fever; the pulse being quick, small, and compressible, the first sound of the heart feeble, the tongue dry, and the strength much reduced. In the former of these states it is the custom to give some slight aperient, and to prescribe a febrifuge mixture, such as one containing citrate of potassium or acetate of ammonium (F. 85). In the latter you should have recourse to stimulants, as carbonate of ammonium and cinchona (F. 71), or quinine (F. 216), along with alcohol, strong beef-tea, chicken broth, soup, and other forms of concentrated nourishment; in fact, you must aim at maintaining the power of the heart and supporting your patient's strength until the fever has had time to run its course.

As these disorders propagate themselves by contagion, you must be careful that all the excretions are removed and destroyed. Carpets, curtains, &c., should be taken away, and the utmost cleanliness enforced. The chance of infection may be further lessened by using a solution of chloride of lime, chloride of zinc, carbolic acid, perchloride of mercury, or permanganate of potassium; and it is a good plan to suspend in the room a sheet or towel wet in one of these solutions.

All the infectious fevers are apt to give rise to inflammations of various organs, which vary in their intensity partly with the age and previous health of the patient, partly with the nature and duration of the fever. In many cases these are more dangerous than the malady from which they have arisen, and they often require skilful and energetic treatment.

In all long-continued fevers, as well as in diseases of the brain and spinal cord, sloughing of the nates is apt to occur from the pressure of the body. You ought not to trust to the report of your nurse that the back is in a good state, but each day you should examine for yourself. As soon as any redness is detected you must have the patient placed upon a circular air-pillow or spring mattress, or, what is better, upon a large water-pillow. If the redness be slight, it will be sufficient to defend the part with a piece of thick leather, covered with soap plaster; but when it is more decided, you should try to prevent sloughing by

other measures. Some advise the part to be washed with spirit of camphor, or a weak solution of nitrate of silver; others recommend that a mixture of collodion and castor oil, or a solution of gutta percha in chloroform, should be painted over the inflamed surface.

When sloughs have formed, you had better apply warm poultices. The late Dr. Murchison advised that a mixture of two parts of castor oil and one of balsam of Peru spread on linen, or that pieces of linen saturated with carbolic oil, should be laid on the sore, and covered with a poultice, to be changed three or four times a day. Yeast, carrot, chlorine, and charcoal poultices, or a few drops of carbolic acid or turpentine mixed with the ordinary linseed poultice, are very useful. To correct fœtor, the parts are to be washed each time they are dressed with a lotion of carbolic acid (fifteen grains to the ounce), sulphurous acid (one in six), chorinated soda (Liquor Sodæ Chlorinatæ four drachms, water eight ounces), or a weak solution of permanganate of potassium. After the sloughs have separated, the sores are to be dressed with some stimulating lotion; and if sloughing returns, strong nitric acid must be carefully applied, followed by poultices.

In every case of fever you should examine the hypogastric region daily, lest the bladder should be distended with urine. Do not neglect this, even if you are assured by the nurse that the patient is passing his water naturally, for a portion may dribble away on account of the bladder being incapable of contraction. If distended, of course a catheter must be used regularly.

A certain amount of weakness and ill-health very commonly follows the recovery from diseases of this class. Various local and general maladies are apt to arise; the patient should, therefore, be closely watched, and any subsequent derangement of the health carefully treated.

SECTION I.

Fevers attended with an Eruption on the Skin.

Measles.

Prognosis.—The prognosis is generally favourable, and where death takes place it is usually from some local complication. In children between four and five years of age there is little risk of a fatal result; whilst young infants often suffer severely. When adults are attacked there is seldom any danger, but the complaint frequently leaves general weakness and ill-health. Occasionally the eruption is slight, or its colour unusually dark, and along with this the pulse is rapid, small, and fluttering; there is great prostration, quick, shallow breathing, and muttering delirium. Such cases are very apt to terminate fatally. A very high temperature is also dangerous. Convulsions before the occurrence of the rash are less serious than might be supposed, the cerebral symptoms usually subsiding as soon as, or before, the spots appear; but if convulsions come on late in the course of the disease the prognosis is grave. Hoarseness or loss of voice ought to be carefully watched, as these often precede an attack of pneumonia. Capillary bronchitis and pneumonia are always serious complications, being the usual causes of death; however favorably the case may have proceeded in the early stage, you should speak with caution as to the result if either of these makes its appearance. The younger the child in which the chest affections occur, the greater is the danger. If the temperature remains high after the eruption has begun to fade, you should dread some complication, especially of the lungs or bronchial tubes.

Treatment.—In an ordinary case there is little occasion for interference during the febrile stage. You may prescribe any febrifuge medicine (F. 85), and follow the general rules laid down for the treatment of infectious disorders. If the cough be troublesome, small doses of ipecacuanha wine will give relief; in case an aperient is required, you should select one that will

not produce irritation, as the complaint is apt to be attended or followed by diarrhœa; you must therefore avoid calomel, jalap, and other drastic purgatives, and order castor oil, magnesia, or an enema. If the temperature rise above 102° F. you may employ cold or tepid sponging. When the disease is ushered in with great depression you must have recourse to ammonia, ether, cinchona, or quinine, supporting the strength at the same time with beef-tea, soup, milk, and brandy or wine. If the extremities are cold you may use the warm bath to hasten the appearance of the eruption, or if the patient is too much exhausted to bear it you should apply hot poultices, sprinkled over with mustard, to the trunk and extremities.

The chief complications of measles are croup, bronchitis, pneumonia—which is usually of a catarrhal form, diarrhœa, and, more rarely, severe bleeding from the nose or other mucous membranes.

Where laryngeal inflammation shows itself, the patient must be kept in an atmosphere of steam; he should remain in bed, talking and all excitement being strictly forbidden. The application of leeches to the throat is rarely necessary, for the strength is already so much reduced by the fever that loss of blood cannot be borne. It is a better plan to trust to poultices, or to constant fomentation by means of a large sponge wrung out of hot water. If there be much dyspnœa, emetics of ipecacuanha should be employed to procure the removal of the mucus: be careful not to use tartar emetic, on account of the tendency to diarrhœa. In extreme cases you may have to perform tracheotomy. If diphtheria presents itself, the treatment must be conducted according to the principles laid down for the management of that disease.

In the pneumonia following measles you seldom require to employ leeches, but should content yourself with frequent doses of ipecacuanha in the first stage, substituting ammonia, bark, or quinine if the pulse shows a feeble condition of the heart. A full supply of liquid nourishment, with or without alcohol, is almost always requisite.

Convulsions in the early stage are best treated by means of a hot bath and some mild aperient. If they are frequently repeated, or if they occur after the disappearance of the eruption,

you must employ bromide of potassium or chloral; in extreme cases you may control them with the careful inhalation of chloroform or ether.

Diarrhœa ought to be carefully watched, and, if excessive, should be checked. You should order some astringent, such as logwood or bismuth, or may use an enema containing tincture of opium. The abdomen must be covered with a hot poultice or spongio-piline if there be much pain, and the patient should be restricted to a diet composed of milk and farinaceous food.

Amer.—If the fever is moderate, a diaphoretic mixture may be given. If the temperature is very high, the wet pack or cold bath may be used and quinine administered. For severe cough Dover's powder should be prescribed, and the chest well smeared with camphorated oil, over which may be worn an oil-silk jacket. For false croup, a sponge soaked in very hot water ought to be applied to the throat. For sickness, a spice poultice to the epigastrium is useful.

Fr.—When the temperature is high, sponging with vinegar should be employed. If the cough is troublesome, give Dover's powder. In cases of pneumonia or bronchitis never use leeches or tartar emetic, but trust to ipecacuanha or James's powder. In case of continued sleeplessness, small doses of chloral may be prescribed. In hæmorrhage, sulphite of sodium or magnesium, salicylate of sodium, or salicylic acid must be ordered.

Germ.—As expectorants, ipecacuanha, liquor ammonii anisatus, or benzoin may be given. When heart symptoms show themselves, lukewarm baths, combined, if need be, with rather cool douches, should be employed. The use of the cold pack is only justifiable when the baths are not practicable.

Rötheln, or German Measles.

Prognosis.—This is always favorable, excepting when it is complicated with capillary bronchitis or pneumonia, which, however, are less apt to occur than in true measles. You should remember that a previous attack of true measles confers no immunity from this, nor is the fact of having suffered from German measles any safeguard against the ordinary form.

Treatment.—This is the same in every respect as that required for measles.

Scarlatina.

Prognosis.—Be cautious in your prognosis, for the complications are so dangerous, that death may result where the initial symptoms have been of the mildest character. Some families are especially liable to suffer severely from scarlatina, and three or four children may die in one household, even when the epidemic is in other cases exceptionally mild. The mortality is greatest in infancy and early childhood, but becomes less after five years of age. Scarlatina is very fatal when in occurs in women who have been lately confined. Where the fever is ushered in with great depression, a feeble pulse, dry tongue, and imperfectly developed or dark-coloured rash, there is great risk. Hæmorrhage from the mucous membranes is usually of evil omen; profuse discharge from the nose is an unfavorable sign, and you must speak with extreme caution of cases that suffer from severe ulceration of the fauces or sloughing of the tonsils, or where a hard brawny swelling of the neck is present. A high temperature is dangerous, and if it persists, whilst the rash is fading, you may look for some serious complication. Slight nocturnal delirium is not necessarily a bad symptom, but when the wandering is present during the day, and is associated with other signs of nervous disorder, such as muscular twitchings and restlessness, or with vomiting or severe diarrhœa, it should be viewed as a sign of very serious import.

The prognosis of scarlatinal nephritis depends on the quantity of urine that is passed, the amount of dropsy, and the presence of convulsions or coma. Scarlatinal rheumatism generally terminates favorably, but the cases of suppuration in the joints that sometimes occur are fraught with great peril to life.

Treatment.—The treatment recommended for other febrile diseases must be carefully carried out. The patient should, however, be always kept in bed for many days after the fading of the rash, and for the next three weeks every means should be employed to protect him from cold, in order to avert inflammation of the kidneys. As the temperature is usually high in scarlatina, cold sponging is almost always required. In

some cases the cold bath or ice-cradle is necessary, and may be frequently repeated.

As soon as the rash disappears it is a good plan to order a warm bath every night, so as to expedite the desquamation of the skin. The patient should be rubbed over with oil or lard after the bath, in order to prevent the falling off of the fine branny particles which are the chief means of propagating the complaint. The urine must be frequently tested for the first two or three weeks, so that the earliest indications of acute nephritis may be observed, and the necessary treatment adopted. The bowels ought to be kept open, but calomel and all other drastic purgatives should be avoided, unless absolutely requisite. Some practitioners have great confidence in carbonate of ammonium, others in chlorine, others in acetic acid or the mineral acids, but there is no evidence that any of these drugs has power to cut short the duration of the fever, or conduct it to a favorable issue.

In cases ushered in with great depression and a low temperature, you must employ the hot bath, or hot poultices to the trunk and extremities, whilst you support the strength of the patient with ammonia, bark, or quinine, alcohol, beef-tea, and other easily assimilated forms of nourishment. When there is excessive heat of the skin and delirium, you should prescribe the cold bath or ice-cradle and a febrifuge mixture. Ringer advises the use of the cold wet-pack in the early stage of the disease when the temperature is high, the patient restless, and when the rash comes out slowly, imperfectly, and is of a dull colour.

In the treatment of severe coryza, which is such a serious symptom in children, the nostrils ought to be frequently washed out with warm warm, or water containing a small quantity of common salt or chlorate of potassium. In ordinary cases it is sufficient that the patient should use some simple gargle to the throat, such as one containing chlorate of potassium (F. 238), for the inflammation generally subsides spontaneously shortly after the disappearance of the rash; or in children who cannot gargle, the same salt may be employed in the form of spray. It is a good plan, in every case, to apply a cold wet compress to the throat, and to continue it during the whole course of the

illness. When there is severe ulceration, or a tendency to sloughing shows itself, you may prescribe with advantage either a gargle or a spray of carbolic acid, sulphurous acid, or permanganate of potassium, whilst the throat may be enveloped in a hot poultice or in a piece of spongio-piline. In some children relief is obtained by the use of steam inhalations, whilst in adults the constant swallowing of small pieces of ice appears to be more useful. Where an abscess threatens, an early opening is requisite, in order to prevent the matter burrowing. The more severe the inflammation of the throat, the more urgent is the necessity for quinine, bark, ammonia, and alcohol; but the perchloride of iron in frequent doses is preferred by many practitioners, and may be given along with chlorate of potassium or quinine.

Cases in which a brawny state of the integuments of the neck is present generally require a liberal supply of stimulants and tonics, and should be always carefully watched. Do not use blisters in scarlatinal sore throat, as sloughing is apt to be produced by them, on account of the depressed condition of the system.

Where a hæmorrhagic tendency manifests itself you must have recourse to general and local astringents, such as perchloride of iron, gallic acid, or ergot, assisted by a nutritious diet and alcoholic stimulants, especially port wine.

Acute nephritis, acute rheumatism, pleurisy, and pericarditis, all of which are apt to show themselves as complications of scarlatina, must be treated on general principles. You ought, however, to remember that your patient is not in a state to bear any depressing treatment, his strength being already exhausted by the fever.

When convulsions occur after scarlatina, the bromide of potassium may be given (five grains for a child three years of age) in frequent doses; and if this proves ineffectual, five grains of chloral may administered in an enema. We have seen the convulsions stopped by the exhibition of dilute sulphuric acid, given in lemonade, more rapidly than by any other means.

Amer.—The cold-water treatment is not required if the temperature is below 103°, although sponging may be used when it reaches 102°. In severe cases, baths or the cold-pack, or the salicylate of sodium, or

quinine, may be used. In cases with frequent, rapid pulse, carbonate of ammonium should be prescribed (5 grs. every hour or second hour in milk, or 10 mins. of the Sp. Amm. Ar., for a child of five years). In cases with severe angina, iron and boracic acid (F. 311) may be given. When there is a diphtheritic exudation, a spray of carbolic acid, or a powder, to be used with an insufflator, should be employed (F. 313). In nephritis, warm baths or hot-air baths may be ordered, along with diaphoretics, or pilocarpine ($\frac{1}{40}$ gr. to $\frac{1}{20}$ gr. every six hours, or $\frac{1}{20}$ gr. subcutaneously, for a child five years old) may be given. In other cases cathartics and diuretics may be prescribed.

Fr.—No depressing measures should be attempted. Milk diet is very valuable in cases of nephritis. In the treatment of scarlatina, salicylate of sodium must be avoided, on account of its tendency to irritate the kidneys.

Germ.—When the throat is much inflamed, children may use a gargle of chlorate of potassium (2 per cent.), or of carbolic acid (1 to 2 per cent.), or a spray of carbolic acid or of permanganate of potassium. In inflammation of the glands of the neck, in the early stage, an ointment of iodoform may be rubbed into the swelling (1 to 15). In cases of otitis, much harm may be prevented by the prompt cleansing of the ears, insufflation of air into the middle ear, or by paracentesis of the membrana tympani.

Smallpox.

Prognosis.—The prognosis is always grave, because the complications may prove fatal in cases that would otherwise pass through the disease without danger. Persons who have been properly vaccinated suffer but slightly in comparison with those who have not undergone this operation. Mr. Marson states that of those who showed four or more well-marked vaccine cicatrices on the arms, only one per cent. died, whilst the mortality was thirty-seven per cent. amongst the unvaccinated.

There is least risk between the ages of ten and fifteen, below five the complaint is often fatal, and after forty the danger increases in proportion to the age of the patient. The pregnant state greatly increases the risk, and abortion usually follows an attack.

Previous ill-health and habits of intemperance greatly lessen the chance of a favorable termination; delirium tremens is apt to

show itself during the course of the disorder in drunkards. The amount of the eruption is, to a certain extent, a measure of the danger. According to Mr. Marson, fifty per cent. of the unvaccinated who are attacked with the confluent form die, whilst eight per cent. of those affected with the semi-confluent, and only four per cent. of those presenting the discrete form of eruption perish. He also remarks that "all symptoms indicating malignancy and a putrescent state of the blood should be looked upon as very unfavorable signs. Hæmorrhage from any of the mucous surfaces, purpura, blood effused under the conjunctiva, or into the smallpox vesicles, should all be regarded as very dangerous symptoms." Great heat of skin is an unfavorable sign, and Wunderlich states that if the temperature in the secondary fever several times reaches above 104° F. the case is a dangerous one.

Very severe lumbar pain, and excessive vomiting persisting after the appearance of the spots, are signs of ill omen. Cases in which delirium sets in early, or where there is laryngeal or tracheal complication, are dangerous. Death may occur at any period, but the most dangerous time is between the eighth and thirteenth days. Varioloid is very rarely fatal.

Treatment.—The ordinary rules for infectious fevers must be carried out. The bowels should be kept moderately open during the whole course of the disease by some saline or other mild aperient. Where diarrhœa takes place, as is not unfrequently the case, it must be checked if the patient's strength appears to be reduced by it. In confluent cases it is advisable to cut the hair at an early period, to prevent the inconvenience arising from an accumulation of the discharge. The throat is usually sore, and adds to the distress of the patient; it is best treated by some mild gargle, such as one of chlorate of potassium (F. 238), or the fauces may be kept moist by the use of red or black currant jelly. Some prefer an astringent gargle, such as one containing perchloride of iron or infusion of roses.

Sleeplessness is a most troublesome symptom, and requires the employment of chloral (F. 108) or morphine. If, however, there is copious expectoration or salivation, you must be careful in the use of sedatives, lest the breathing become embarrassed by the accumulation of fluid in the pharynx or bronchial tubes.

Patients suffering from delirium must be carefully watched, lest they injure themselves or others. If it be violent, small doses of morphine and tartar emetic are most useful; in milder cases you will obtain more benefit from the use of alcohol, a good diet, and quinine, at the same time that you procure sleep at nights by a dose of morphine. Where a female patient is suffering from gonorrhœa, the greatest attention should be paid to cleanliness, for sloughing is apt to occur under such circumstances.

In the treatment of the complications of smallpox, you must never lose sight of the fact that your patient is already greatly reduced in strength by his illness, so that your efforts must be directed to sustain his vital powers, as soon as the secondary fever has made its appearance, by quinine (F. 215), acids (F. 209), and a liberal diet. Pleurisy is best treated by poultices and fomentations externally, and by small and frequently repeated doses of opium. Pneumonia is generally of an asthenic character, and requires the use of ammonia (F. 122), bark, wine, and a liberal diet. In bronchitis you may place the patient in an atmosphere of steam if the symptoms are severe; but if mild some expectorant medicine will usually suffice to relieve him. Boils and abscesses require assiduous poulticing, and any collection of pus should be early and freely opened. Their occurrence indicates the necessity of a tonic and stimulating treatment.

Various measures have been proposed to prevent the disfigurement caused by the pustules on the face. Mr. Marson advises that we should "wait until the pustules have discharged and the discharge has begun to dry; then put on some of the best olive oil, or a mixture of one third of glycerine and two thirds of rose water; some of this may be applied twice a day for a few days, until the scabs begin to loosen. Cold cream, oxide of zinc, or olive oil and lime water form good applications; or if the discharge is thin and excoriating, calamine mixed with olive oil. The patient should be warned not to allow the scabs to dry and remain some time on the nose and other parts of the face, particularly on the forehead and near the end of the nose; when this takes place the dry scabs themselves leave deep marks in the skin, worse than the eruption of smallpox itself."

Amer.—To relieve severe pain of the back an india-rubber bag, filled with hot water, should be applied to the part. Gargles of chlorate of potassium, tincture of myrrh, tincture of cinchona, or a spray of a solution of boracic acid may be used. To prevent the pitting of the skin, the solar light should be excluded from the room, and a solution of boracic acid (1 drm. to 1 pint of water) must be applied by means of compresses, which should be frequently changed, or, if desired, they may be covered with a piece of oiled silk.

Fr.—In case of delirium, if the fever is moderate, give bromide of potassium, chloral, or Dover's powder, in combination with liquor ammonii acetatis. When the temperature is high, salicylic acid or infusion of digitalis should be prescribed. When the patient has been addicted to alcohol, wine and spirits must be allowed.

Germ.—In the early period baths may be used, or an ice-bag applied to the head to relieve the headache. A paste, composed of carbolic acid, 4 to 10 parts; olive oil, 40 parts; prepared chalk, 60 parts; should be spread on linen and applied to the parts where the eruption is apt to be worst. This application should be changed every twelve hours.

Chicken-pox.

The *prognosis* is always favorable. It usually ends in recovery in a few days.

Treatment.—The complaint requires little treatment; that recommended for acute infectious fevers may be employed.

Typhoid Fever.

Prognosis.—The average mortality is about 17 per cent. Death may occur at any period of the fever, but it most usually takes place at the end of the third or the beginning of the fourth week, the general cause being failure of the power of the heart. The prognosis is favorable in children; after forty years of age the mortality greatly increases. Stout persons are more apt to succumb than those who are thin; pregnant females are unfavorable subjects, and drunkards are especially liable to sink on account of brain complications. A very frequent pulse and a feeble first sound of the heart are bad signs; if the pulse

be maintained above 120, great weakness of the heart may be surmised. A high temperature is unfavorable, and its point of elevation at the end of the first week may be taken as a guide to the amount of the subsequent fever. Excessive diarrhœa and copious hæmorrhage from the bowels are bad signs, as indicating deep and extensive ulcerations. Perforation of the intestine is rarely recovered from. The danger varies in proportion to the severity of the disturbance of the nervous system; thus a case is of a very unfavorable character when stupor or delirium becomes continuous, or muscular twitchings present themselves.

Treatment.—In no other disease have so many drugs been brought forward as specifics, but all have proved to be of little or no value. The same general rules must be therefore observed as in the management of other acute infectious disorders. Free ventilation, cleanliness, careful dieting, and good nursing are more to be trusted than drugs. There is no doubt, however, as to the value of reducing the heat of the body by means of cold sponging or baths, but they must be frequently repeated in order to be of any real use. The thermometer should be constantly consulted, and as soon as it indicates a heat in the axilla of 103° F., one or other of these measures must be employed. By far the most convenient method of reducing the temperature is the use of sponging followed by the ice-cradle. This should be repeated as often as the temperature rises to 102·5° F. or 103° F.; in bad cases the cradle may be maintained in its position for many days, the sponging with cold or hot water being applied every three or four hours.

The diet should consist entirely of liquids, and may comprise beef-tea, soup, milk, or farinaceous food. Milk is the most generally useful, and as much as four ounces may be given every two or three hours; but the stools should be examined daily, and if much curdy material be evacuated, the quantity should be diminished, or it should be mixed with water or lime water. When milk cannot be easily digested, whey or peptonised food may be substituted. If there is much distension of the abdomen, farinaceous food should be omitted and animal broths given instead of it. Daily listen to the sounds of the

heart, and if the first sound becomes weak or toneless, or the pulse feeble, you should prescribe alcohol. In young persons wine answers well, but in adults it is better to trust to brandy, given frequently and in moderate doses. If the temperature rises, or the patient becomes more restless or delirious after it has been administered, you must lessen the dose or withdraw it; but where this is not the case it should be continued. In an ordinary case, two to three ounces will be sufficient for the twenty-four hours, but where there is great depression this amount may be much increased.

When the patient is convalescent, let the diarrhœa entirely cease for one or two weeks before you allow solid food, lest a relapse be induced. In hospital practice, see that the friends do not introduce food, for mistaken kindness often induces them to do so in order to relieve the hunger of the patient. After the first week or ten days you may give quinine (F. 215); before this time it is wiser, unless there be excessive depression, to prescribe moderate doses of phosphoric or sulphuric acid.

Some writers insist on the great value of calomel, quinine, digitalis, and cold baths in the treatment of typhoid fever. Liebermeister says, "If the patient be admitted before the ninth day of the disease, he is first given calomel, usually two to four doses, of eight grains each, in the course of a few hours, to which very often one or two doses are added next day. From the time of his admission his temperature is taken every two or three hours by day, and in somewhat severe cases by night also; and whenever the temperature in the axilla reaches or exceeds 102° F., a bath of 68° F. in temperature and of ten minutes in duration is given. Patients who require six or more baths during the twenty-four hours generally receive on the second evening twenty-two or thirty-seven grains of quinine, the measurements of temperature and the baths, as often as required, being still continued. If towards morning the temperature falls to 100·5° F. in the rectum, and if this remission is such that no baths are needed for twelve hours or longer, then forty-eight hours after the first dose a second one of the same size, or perhaps a smaller one, is given. If, however, the fall of temperature was not sufficient, then the second dose is made larger, reaching forty-five grains. If this prove sufficient,

then the same dose, or a smaller one, is repeated every second night as long as the continuance of the fever seems to demand it. In the very severe cases in which even forty-five grains of quinine seem insufficient, recourse is had to digitalis as soon as the morning after the administration of quinine."

It is right to add to the above statement that the late Dr. Murchison, whilst admitting that no permanent ill-effects had followed the use of large doses of quinine, and that the temperature was thereby reduced, adds that "the effect is transient," and that whilst no decided harm resulted, "occasionally delirium and collapse were induced." He thinks quinine of use where "the disease is at its crisis, and the temperature is rising instead of falling." We never prescribe quinine in the early stages, as we have always found it useless, if not injurious; but as soon as the temperature becomes remittent, in the third or fourth week, ten grains are ordered once or twice a day. This method of treatment appears to prevent relapses. and tends greatly to the recovery of the patient.

There has been much difference of opinion respecting the management of the diarrhœa, some recommending that it should be assisted by aperients, others that it should be restrained. As a general rule, it is best to leave it alone if there be only one or two liquid stools in the day and the patient's pulse remains good; but if it be excessive, and the heart is failing, it ought to be checked. In the slighter cases it will be sufficient to prescribe chalk or bismuth (F. 25), with opium, and catechu or kino. Where the diarrhœa is severe you must use the salts of copper (F. 55), lead (F. 60), or silver, as vegetable astringents are not then of much value. Perhaps the most useful of these is the sulphate of copper (one quarter of a grain with one quarter of a grain of opium every three hours). If there be much irritation about the rectum, a suppository or an enema of opium is indicated. Constipation is apt to follow the fever, and in that case the bowels require to be relieved by an enema or some very mild laxative, such as castor oil or the compound rhubarb powder. All severe aperients must be avoided, lest the healing ulcers of the intestine be irritated.

Excessive distension of the intestines produces in some cases great inconvenience. It is a good plan to roll a wide flannel

bandage round the abdomen, and to prescribe small doses of wood charcoal or a carminative mixture. If this does not afford relief, you may apply flannels wrung out of hot water and sprinkled over with turpentine, or ten drops of turpentine may be given by the mouth every three or four hours. In severe cases an india-rubber tube should be passed up the rectum, and the flatus evacuated by means of it.

Where hæmorrhage occurs, you had better not interfere if it be small in quantity; but when it is copious, you must restrain the action of the intestines by small doses of opium, frequently repeated. Do not give large doses of opium, as they have a tendency to depress the action of the heart. If the patient be very weak you may prescribe frequent doses of turpentine (ten or fifteen minims), as this drug acts as a styptic, at the same time that it stimulates the heart. Some recommend that a bladder of ice be placed upon the abdomen, but you should be cautious about doing this when the heart is feeble. You may give gallic acid (F. 45), ergot (F. 46), or perchloride of iron, or you may inject ergotine subcutaneously. Some authors trust chiefly to sulphate of copper, in doses of one quarter of a grain.

Perforation is apt to occur in the later stages of the complaint, and is often preceded for a day of two by pain and tenderness of the abdomen. You should, therefore, at each visit, press gently over the abdomen, and if there is any well-marked tenderness, apply a flannel bandage rather firmly round the body, and prescribe small doses of opium, the knees being supported in the flexed position. In some cases peritonitis occurs without perforation, and the same treatment is required. After perforation has taken place, your only hope of recovery depends on the most rigid abstinence from food, perfect rest, and the frequent injection of morphine subcutaneously.

When much headache is complained of, you may keep the head covered with cloths wrung out of cold water, and if the pain is very violent in the early stage of the fever, you may apply a few leeches to the temples. Where sleeplessness is a prominent symptom in the early stage, a moderate dose of chloral or morphine, with or without tartar emetic, may be prescribed, but you must be cautious in the use of sedatives if the

heart's action be feeble. When sleeplessness or persistent delirium occurs in the later stages, food and stimulants must be freely given, and a dose of chloral, sulphonal, or morphine should be administered at bedtime, along with some brandy or whisky and hot water.

Always be on the watch for any appearance of bedsores, and see that there is no retention of urine. Do not forget that the urine may dribble away freely, whilst the bladder is distended and requires the use of the catheter. In the later stages of the fever you should frequently examine the back of the lungs; if you discover any evidence of congestion, order the patient to be shifted from one side to the other every three hours, so that each lung may in turn be freely inflated.

Plugging occasionally takes place in the veins of a limb; if there is pain and swelling, raise the limb and direct it to be frequently fomented with flannels wrung out of hot water. Do not permit the patient to take exercise so long as any obstruction can be felt in the veins.

Amer.—To reduce fever, febrifuge medicines may be given. When the temperature is not above 102° F., quinine, in combination with the mineral acid, should be prescribed, but if the tongue becomes dry and fissured, add 10 minims of turpentine. Where the temperature remains high, baths are required. The diet should consist of milk, or milk diluted with lime water, or mixed with barley water (three or four pints daily, four to six ounces every two or three hours). If the stools contain undigested milk the quantity should be lessened, and beef-tea substituted. If the action of the heart is feeble, give alcohol, usually a dessert-spoonful of whisky or brandy every three hours, but when necessary, eight ounces may be given daily. Some forbid all solid food until two weeks after convalescence; others advise meat from the beginning of the convalescence. When the diarrhœa is excessive, opiate enemata are of most use. Tympanites requires embrocations of turpentine or camphor. In slight cases of hæmorrhage small doses of opium may be given, but if severe, the subcutaneous injection of three to five grains of ergotine is required. In sleeplessness, opium is more useful than other drugs, and if there is much tremor, camphor may be combined with it.

Fr.—As soon at the temperature rises above 102·5° F., cold applications should be employed. Sponging with pure aromatic vinegar is more useful than the application of water, and baths are seldom required. Quinine may be given to reduce the temperature. Beef-tea and milk

constitute the best diet, and alcohol in some form is usually required. In case of severe hæmorrhage, apply an ice-bag to the abdomen, and give internally the perchloride of iron. If the chest symptoms are threatening, let the patient be frequently changed from side to side, and dry cupping be used to the chest.

Germ.—Begin the use of baths at 103·6° F., and, to assist in the reduction of the temperature, quinine or antipyrin (15 to 20 grs. every three hours) may be administered. Let the patient take milk, broth, soup thickened with rice or sago; coffee and milk, or cocoa and milk. In other cases a roll or rusk soaked in milk may be given. Weak tea may be allowed, but no effervescing liquids. When the patient is very feeble, fine shavings of raw beef or beef-tea will assist in maintaining his strength. Wine is generally required.

Typhus Fever.

Prognosis.—The mortality varies greatly in different epidemics, but over a series of years it amounted, in the London Fever Hospital, to 18 per cent. It is least fatal to young children; after fifty-five years of age it cuts off nearly one half of those attacked. Stout people are more apt to sink than those who are thin, and habits of intemperance greatly lessen the chance of recovery. A dark red rash, a very high temperature, or a sudden rise of temperature at the end of the third week, a feeble, fluttering pulse, a feeble first sound of the heart, early delirium, and profound coma are very unfavorable signs.

Treatment.—The general method of treatment is the same as that required for typhoid, but quinine and acids seem to be especially useful. The patient must be carefully fed, and alcohol prescribed if the state of the pulse requires it. There is not the same tendency to diarrhœa as in typhoid; more generally the patients require an aperient, which should be as mild as possible.

Pneumonia and bronchitis are the most common complications. They are best treated by means of hot poultices to the chest, and carbonate of ammonium with infusion of senega (F. 122) or bark internally. Alcohol is usually necessary if the symptoms are of a threatening character.

Where sedatives are required, do not give opium if the pupils are contracted; cannabis indica (F. 177) has been recommended by some authors as a useful substitute: when the pupils are not contracted, a mixture of chloral and morphine is often of advantage.

Relapsing Fever.

Prognosis.—Notwithstanding the threatening aspect of this fever in its early stage, the mortality is only two or three per cent., and most cases die of the complications rather than from the disease itself. Some epidemics are more fatal than others, the mortality in some instances having reached 14 per cent. of those attacked. The greater number of deaths occur during the first relapse, or in the second interval between the attacks of fever.

Treatment.—This is the same as that of other acute infectious disorders, for we have no drug capable of shortening the first attack or preventing a relapse. Quinine in large doses, the cold bath, and other remedies have been tried in vain. Stimulants should be used if the heart seems to fail.

Where the headache is severe, cloths wet in cold water, or bladders of ice, or a Leiter's coil to the head are of value. The application of a blister to the nape of the neck not unfrequently affords relief, but the most certain remedy is the subcutaneous injection of one quarter of a grain of morphine, which may be repeated if necessary. Morphine is not contra-indicated by the presence of jaundice, but it should not be given if there is a tendency to stupor, or if the urine is albuminous.

Insomnia is one of the most distressing symptoms, and may be combated by morphine, chloral, bromide of potassium, or sulphonal, but chloral must be given with caution if the action of the heart is feeble.

Severe vomiting requires the application of a blister to the epigastrium, and a small dose of calomel ($\frac{1}{8}$ gr. or $\frac{1}{4}$ gr.) every two or three hours is generally of service. Active purgatives must be avoided, as severe diarrhœa often occurs spontaneously.

In the intervals of the attacks, stimulants and tonics should be administered, in order to maintain the strength of the patient; but quinine, arsenic, salicylate of sodium, and, in fact, every other drug that has been tried has failed to prevent the relapses of the fever.

Muscular pains are best treated with hot fomentations and sedative liniments, such as those containing chloroform (F. 192), belladonna (F. 194), and opium.

The jaundice requires no special treatment, and usually subsides spontaneously after a short time.

During convalescence tonics are required, and if muscular pains persist the ammoniated tincture of guaiacum may be added.

Erysipelas.

Prognosis.—This disease is frequently met with as a consequence of injuries and operations; when idiopathic it usually terminates favorably, subsiding in from six to ten days. Its probable issue is to be determined by reference to the state of the patient's general health, rather than by the severity of the local inflammation. The more the symptoms resemble those of typhus the more dangerous is the case, because pyæmia is then probably present. Very young children and old persons are most liable to succumb to the disease. Previous ill-health makes erysipelas especially dangerous; thus, when it occurs in persons suffering from, or recovering from, typhus fever, it is usually fatal, and it places the patient's life in great jeopardy when it attacks those affected with chronic liver or kidney disease. A slight amount of delirium does not necessarily indicate danger, but you should view with great suspicion persistent delirium of a low form, or a tendency to drowsiness. Occasionally the inflammation attacks the throat, producing œdema of the glottis, and such cases are very apt to terminate fatally.

Treatment.—In all cases it is necessary to give rest to the inflamed part, and to keep it in such a position as will favour the return of the venous blood from it. Venesection and leeching are now generally abandoned, and you should support the

action of the heart instead of depressing it. As the stools are usually dark and offensive, you may commence your treatment by freely evacuating the bowels, either by a dose of calomel (F. 161) or some other active purgative. If the case is slight, you may content yourself with supporting the patient's strength with beef-tea, soup, milk, and eggs; but wherever there is a very feeble pulse or a brown tongue, alcohol should be administered; the quantity of the stimulant ought to be in proportion to the amount of depression.

Perchloride of iron is looked upon by many writers as a specific for erysipelas; in ordinary cases they prescribe ten to twenty minims every four hours; in those that are more severe forty minims may be given, whilst still larger doses have been employed when the danger to life appeared imminent.

The local remedies that have been proposed are innumerable. In slight cases it is sufficient to apply cotton wool, so as to exclude the air from the inflamed part, or to dust it over with powdered starch or flour, or with a mixture of oxide of zinc and starch. Where the pain is excessive, relief is often afforded by fomentations with a decoction of poppy-heads, or by covering the part with spongio-piline, soaked in hot water and sprinkled over with laudanum. Some advise the application of collodion mixed with glycerine or cod-liver oil, and spread over the part with a brush: others prefer the use of a lotion of sulphate of iron (one drachm to the pint), hyposulphite of sodium, boric acid, or bicarbonate of sodium; or that the part be painted over with a strong solution of nitrate of silver (one part to three of water).

Where the pain is severe and no sleep can be obtained, recourse must be had to morphine, chloral (F. 109), bromide of potassium, Indian hemp, or sulphonal at nights; but, as a general rule, sedatives are not well borne in erysipelas, and large doses should be avoided.

If abscesses form as a consequence of the inflammation, the pus should be evacuated by a free and early incision.

The slightest sign of laryngeal complication must at once arrest your attention, and the treatment should be directed to avert œdema of the glottis, or to save the life of the patient by the prompt performance of laryngotomy if this should take place.

SECTION II.

Fevers attended with some Local Affection.

Diphtheria.

Prognosis.—No case, however slight, can justify a favorable prognosis, for, at any moment, symptoms of a dangerous character may be developed. The chief causes of death are an affection of the larynx, septic poisoning, failure of the heart, and hæmorrhage from the affected parts. The younger the child the greater the risk, as at an early age laryngeal complication is most apt to occur; feeble or unhealthy persons are likewise especially apt to sink under it. Like scarlatina, some families seem to be more severely affected than others, and you ought at once to scatter the remaining members of a household when one has become affected with it. The general mortality varies greatly in different epidemics, but on the average it amounts to 30 or 40 per cent.

The greater the extent of the exudation the more imminent is the danger; and where there is much fœtor a fatal termination is probable. If the posterior nares are implicated the issue is almost always unfavorable, and cases usually terminate badly if a wound or sore, such as a blistered surface, becomes the seat of the diphtheritic process. A very rapid or a very slow pulse is a bad sign, so is any great increase of temperature after the fifth day, as is also a persistence of a high temperature after the tenth day; a temperature of 105° F. betokens great danger.

Even after the patient has apparently recovered a fatal relapse may occur. As a general rule, the paralyses which follow diphtheria do well; a slight loss of power in the muscles of the palate usually disappears in two or three weeks, but more extensive paralysis may require many months before recovery is completed.

Treatment.—As the exudation in the throat was formerly considered the first manifestation of the disease, every effort

was made to remove it; some tore it forcibly from the mucous membrane, others attempted to destroy it by the application of nitrate of silver or strong hydrochloric acid. At the present day such measures are generally abandoned, not only because a fresh membrane is formed as quickly as the original one is removed, but also from fear that an injury to the mucous membrane may favour the extension of the exudation into the tissues. We are recommended to apply to the surface of the inflamed part, as well as to the membrane, a moderately strong solution of perchloride of iron (one drachm to an ounce) or of nitrate of silver (twenty grains to an ounce). Some practitioners have great confidence in the application every half-hour to the false membranes of a solution of papain, others prefer lime water, or a solution of lactic acid (one to ten or twenty-five parts of water). These applications are seldom used at the present time, being valueless.

If there be much fœtor from the decomposition of the membranes and discharges, you may apply any of the above disinfectants, or you may irrigate the parts by means of a spray-producer, with a solution of carbolic acid (two and a half grains to an ounce), or permanganate of potassium (one grain and a half to an ounce), or with dilute sulphurous acid. The soreness of the throat is best relieved by the constant swallowing of small pieces of ice, or by a gargle of warm water.

When the nares are affected, you may syringe them with a solution of perchloride of iron (thirty minims of the tincture to one ounce of water), or with a weak solution of common salt, or of chlorate of potassium, and if they are much obstructed you must employ an irrigator. Dr. Jacobi recommends in severe cases a solution of carbolic acid (two to four grains to one ounce of water). "Nasal injections must be made very frequently until each time the stream of fluid has a free exit through the other nostril or through the mouth. They must be made at least every hour, and even oftener if necessary; at the same time it is advisable to be careful that the fluid does not enter the Eustachian tube. This can be prevented to a certain extent by compelling the patient to keep the mouth open during the procedure."*

* Pepper's 'System of Practical Medicine by American Authors.'

Dr. Oertel strongly recommends the constant use of steam at 113° to 122° Fahr., passed into the mouth by a funnel. He states that "the inhalation should be practised for one quarter of an hour, every half-hour, and on the first and second day three, or, at the utmost, four hours' sleep must suffice for the patient, whilst nourishment must be supplied in small portions in the intervals. The intervals may be lengthened as the membranes are detached, and the throat becomes more healthy."

The patient should be carefully kept in bed until convalescence is completely established, lest a relapse take place. Avoid all unnecessary purgatives; if the bowels require an aperient, you may prescribe an enema or a dose of some mild laxative. The enlarged glands should be covered with a hot poultice or fomentation, but do not apply leeches or blisters, lest the sores thus produced should be attacked by the diphtheritic process.

There is always great depression of strength, and you should prescribe a liberal diet, consisting of beef-tea, milk, soup, eggs, &c. Most practitioners treat diphtheria with the tincture of perchloride of iron, in the same doses as are employed in erysipelas.

The most successful treatment at the London Hospital has consisted in the administration every hour, for an adult, of a mixture containing forty minims of the tincture of the perchloride of iron, four grains of the chlorate of potassium, and half a drachm of glycerine in water. The patient is made to retain the medicine as long as possible in contact with the mucous membrane of the throat before he swallows it. A solution of sulphurous acid (one part to two or three of water) or perchloride of mercury (1 in 2000) is also frequently sprayed upon the affected parts.

Where there is much heat of the skin, two to four grains of quinine every four hours will be of service; if, on the contrary, the skin is cold and the pulse feeble, rapid, and irregular, you must have recourse to ammonia and bark. Alcohol is almost always necessary; some prefer brandy, others champagne, port wine, or claret.

There is seldom much pain, or, at any rate, the suffering is

not in proportion to the amount of exudation and inflammation. If the patient be much exhausted from want of sleep, small doses of chloral or morphine may be used, but sedatives should be employed with caution.

When diphtheria attacks the larynx, emetics may be given to dislodge the membrane, and if these are unsuccessful, tracheotomy should be performed. In case of hæmorrhage from the nose, you may inject a solution of alum or tannic acid, and give gallic acid or ergot internally (F. 46); if these fail, the nares must be carefully plugged. Diarrhœa, if severe, requires astringents, such as bismuth and opium; but if it resists these, sulphate of copper and opium (F. 55) may be used.

Amer.—The affected parts should not be cauterised, but if a strong application is required, equal parts of carbolic acid and glycerine may be applied. Solutions of salicylic acid, lime water, lactic acid, carbolic acid, &c., have been used to the throat in the shape of gargles, or as sprays. Turpentine inhalations are most readily managed by pouring a tablespoonful of turpentine on water kept boiling by means of a lamp. In nasal diphtheria, injections of carbolic acid (2—4 grs. to 1 oz. of water) should be made every hour, the patient being compelled to keep the mouth open, so as to prevent the fluid entering the Eustachian tubes. In other cases a solution of perchloride of mercury (1 : 5000—10,000) may be employed. Great pain or swelling of the glands requires the application of cloths rung out of ice-cold water, or an ice-bag. When the patient is very feeble, ammonia, alcohol, musk, or camphor should be given. The perchloride of iron is the most valuable medicine (F. 315), but some practitioners prefer the perchloride of mercury in the early stage.

Fr.—Local applications to the affected parts are best made by means of a spray-producer, and may consist of lime water or solutions of tannin, alum, or benzoate of sodium. Copaiba, cubebs, and cyanide of mercury have been strongly recommended.

Germ.—When it is considered necessary to apply a caustic in the early stage, a solution of nitrate of silver (1 : 10) or a mixture of equal parts of carbolic acid and alcohol should be selected. After the very early period caustics are of no use. A solution of papayotin (5 per cent.), applied frequently, will dissolve the diphtheritic exudation. The best substances for direct inhalation are carbolic acid (1—2 per cent.), lime water mixed with an equal quantity of distilled water, and chlorate of potassium (2 per cent.).

Pyæmia.

Prognosis.—Although this is usually looked upon as a surgical malady, it not infrequently confronts us in medical practice. It is probable that most of the infectious fevers prove fatal by producing septicæmia, as in some of them abscesses are common consequences. The prognosis of well-marked cases of pyæmia is always unfavorable, but patients occasionally recover where there was every reason to believe this condition was present. In surgical practice recovery is rare; after parturition the chance is somewhat better, although a fatal issue is the rule.

Treatment.—Various measures have been tried to obviate the ill effects produced by the presence of the poisonous materials in the blood. Thus the hyposulphites and the sulphocarbolates have been administered, but hitherto without success. In surgical practice any collection of pus should be at once evacuated, and every effort made to prevent further infection. The patient should be placed under the best hygienic conditions, free ventilation of the room insisted upon, and the strength supported by food and alcohol in liberal quantities. Most practitioners give three to five grains of quinine every four hours, along with acids; some place more reliance on carbonate of ammonium and bark (F. 71). If there is excessive diarrhœa, opium and astringents must be employed; if restlessness and want of sleep are prominent symptoms, you must have recourse to moderate doses of opium or chloral.

Acute Tuberculosis.

Prognosis.—This disease closely simulates, in many of its features, typhoid fever, but is much more dangerous. In all probability some cases recover for a time, since it is not unusual for persons suffering from phthisis to state that the first symptoms of their disease followed what they term "gastric fever." As a general rule, however, acute tuberculosis is a most fatal

malady, the patient being usually cut off by an inflammatory affection of one of the serous membranes, or by pneumonia.

Treatment.—As there are often no symptoms pointing to a local complication, the treatment must be regulated by the same principles as those applied to fevers attended with an eruption.

You must insist on perfect rest of body and mind; if the temperature be high, as it generally is, see that the patient is kept in bed; where the pulse is unusually rapid, you may prescribe digitalis (F. 78), aconite (F. 68), or quinine, but the reduction of the pulse does not necessarily imply any real improvement. The bowels should be kept open, but no good results follow free purging; on the contrary, it is apt to set up ulceration of the intestinal glands.

Arsenic is stated by Ringer to be beneficial, and he gives as much as two to four minims every two or four hours; he states that only in a few cases has it produced sickness or pain of the stomach or bowels. Others prefer the salicylate of sodium with quinine. We have generally found a pill composed of quinine, digitalis, and a small dose of morphine more useful than any other form of treatment; arsenic has proved of little value.

When the temperature is high you should order cold sponging and the ice-cradle, and in extreme cases the cold bath; salicylate of sodium and salines (F. 85) may be useful in promoting the reduction of the temperature; if restlessness is a prominent symptom, you may give small doses of chloral or morphine.

Parotitis.

Prognosis.—Inflammation of the parotid gland occurs either as an epidemic (mumps), or as an accompaniment of typhus or other severe fevers.

Epidemic parotitis, or "mumps," is never attended with danger to a person previously healthy. The swelling of the gland generally reaches its height about the third, and subsides about the eighth or ninth day. Occasionally, in adults, the

testis becomes inflamed, but this also disappears of itself in a few days.

When parotitis is an accompaniment of typhus or any other inflammatory disease, it proceeds rapidly to suppuration, and is named symptomatic parotitis. When it presents itself in the early stage of a fever it is almost always fatal, but recovery may take place when it occurs during convalescence.

Treatment.—In the epidemic form no particular treatment is required, beyond keeping the bowels moderately open, and placing the patient on a restricted diet. If there be much pain, you may order fomentations to the part, or frictions with a sedative liniment (F. 192). When the pain is very severe two or three leeches may be applied, but this is rarely requisite. Sleeplessness may require a dose of Dover's powder, or bromide of potassium or chloral at bedtime.

Tonics, such as iron, quinine, nux vomica, or the mineral acids, are generally necessary during convalescence, as the patient often remains weak and feeble for some time after the disappearance of the local malady.

Symptomatic parotitis is only a complication of a more serious malady, and requires no special treatment beyond the application of hot poultices to encourage suppuration and relieve pain, and the opening of the abscess as soon as the presence of pus can be ascertained.

Influenza.

Prognosis.—The prognosis is favorable, excepting in the case of very young or of old persons, who sometimes sink from the depression occasioned by it. Those who are attacked whilst affected with any severe chronic disease, especially of the respiratory organs, should be carefully watched, for in such cases it is apt to prove fatal. Second or even third attacks are not uncommon.

Treatment.—Influenza usually subsides spontaneously in a few days. It is generally sufficient to confine the patient to one room, but if there be much debility or a high temperature, he ought to remain in bed. Under ordinary circumstances an

aperient should be given at the onset, and a saline mixture, containing chloride of ammonium (F. 119) or acetate of ammonium (F. 124), may be administered every three or four hours. When the pains of the head or limbs are severe, antipyrin or salicine in repeated doses will afford relief.

Where the patient is old or feeble you must have recourse to carbonate of ammonium and bark (F. 71), or moderate doses of quinine (Fl. 26), and if there be any failure of the heart, wine or brandy must be prescribed. Even when convalescent the patient generally remains very feeble, and should be treated with iron, quinine, and other tonics. The diet should be nutritious, and may consist of soup, beef-tea, milk, and eggs.

The cough is the only symptom that gives much trouble; it must be treated upon general principles.

Hooping-cough.

Prognosis.—This is generally favorable, excepting in the very young. Children under four months old are liable to convulsions, whilst adults are subject to chronic affections of the lungs as a consequence of hooping-cough. Where the paroxysms are very severe in a feeble child, or if capillary bronchitis or catarrhal pneumonia ensues, the prognosis should be very guarded. Convulsions are always an unfavorable sign, but they are not necessarily fatal.

Treatment.—During the first stage, whilst there is fever and the attacks of spasm are undeveloped, it will be sufficient to protect the child from cold; let it be kept in a moderately warm room, and let the gums be lanced if any teeth are projecting. The bowels should be freely opened, and the diet restricted to milk and farinaceous food. A febrifuge mixture may be given, such as one containing citrate of potassium or acetate of ammonium, along with small doses of ipecacuanha. If the expectoration is tough and scanty, alkalies are of service, such as the bicarbonate of potassium, chloride of ammonium, or liquor potassæ mixed with oil. In the later stages the cough often appears to be aggravated by the excessive quantity of mucus secreted, and under such circumstances alum or tannic acid may

be prescribed with advantage. The digestive organs should be carefully attended to, as any error in diet is sufficient to increase the severity of the cough. Attacks of gastric catarrh often present themselves, during which tonics should be abandoned, and suitable treatment adopted.

In long-standing cases the child becomes pale and feeble, and loses strength. When this occurs you should give cod-liver oil, which improves the digestion and also renders the expectoration looser. The whole list of sedatives has been searched for remedies for hooping-cough. Belladonna has been advised by some, conium by others; Indian hemp, henbane, hydrocyanic acid, each has its advocates. As a general rule, bromide of potassium is the most useful, and may be combined with small doses of hydrocyanic acid or chloral. When the disease is of long standing, you may give bromide of iron instead of bromide of potassium. Antipyrin is sometimes useful.

With the object of lessening the irritability of the mucous membrane of the larynx, some advise that it should be frequently painted with a solution of nitrate of silver or perchloride of iron, but this is very difficult to perform in the case of young children. In severe cases the inhalation of a few drops of chloroform or ether is often of service. Inhalation of creasote has been also employed, but it should be used only in chronic cases.

Counter-irritation is always of use, and should be employed during the whole course of the illness. The liniment may contain turpentine or ammonia, and it should be applied both to the front and back of the chest.

Tonics are always useful when the disease has lasted for some time. You may give quinine or bark, along with one of the mineral acids, or some preparation of iron; the phosphate, lacto-phosphate, and carbonate being the most useful. If the iron does not agree, zinc may be substituted; in other cases arsenic is of value, especially where the disease has been unusually rebellious to treatment. Change of air, and especially a residence at the sea-side, is the most valuable tonic in all chronic cases, and is often successful where medicines have been tried in vain.

Amer.—Belladonna, chloral, hydrocyanic acid, and bromide of potas-

sium or of ammonium may be employed to relief the cough, at the same time that counter-irritants are applied to the chest. Emetics of ipecacuanha or of alum should be given when the secretion has become very tenacious, and the paroxysms frequent and severe. The muriate of pilocarpine has been recommended, but it must be always given along with stimulants, lest it should depress the heart. A solution of nitrate of silver may be applied to the larynx, bromide of potassium should be employed as an inhalation, or the vapour of benzole or of carbolic acid may be used. In the later stages, quinine, iron, hypophosphites of sodium and lime, and cod-liver oil are of great value.

Germ.—Quinine, belladonna, atropine, or bromide of potassium may be prescribed, or inhalations of carbolic acid, turpentine, or of benzine may be used. Inhalations of chloroform and ether have been recommended.

Cerebro-spinal Fever.

Prognosis.—The mortality varies from thirty to seventy per cent., the average being about forty per cent. No case can be looked upon as not dangerous, for complications may carry off the patient, even when at the outset the symptoms were mild. An early occurrence of delirium or of coma, and the recurrence of vomiting and severe headache, when the patient appears to be recovering, are bad signs.

Treatment.—As we have no means of checking the general disorder of the system, we must be content with trying to alleviate the inflammation of the cerebro-spinal membranes resulting from it. Perfect rest must of course be insisted upon, together with the exclusion of light and sound.

Venesection, which was formerly employed, is now generally abandoned, but some authors still advise the application of leeches behind the ears, or the withdrawal of blood from the neck by cupping. All agree in the recommendation to use bladders filled with ice to the head, and also to the spine, when the inflammation seems to have attacked the cord.

The bowels should be freely opened, and some foreign physicians advise the use of mercury, so as to affect the gums. Baths and quinine are useless. Most practitioners prescribe opium, in order to relieve pain and subdue the inflammation; when the pain is very intense you may inject subcutaneously

one quarter or one third of a grain of morphine, and repeat it frequently; when the suffering is less severe, you should prescribe frequent doses of opium by the mouth.

When the patient is convalescent many practitioners prescribe iodide of potassium, along with bark (F. 9), in order to hasten the recovery by the removal of the exudation.

The diet should consist of beef-tea, milk, soup, and eggs, to which alcohol may be added in case of failure of the heart.

Dysentery.

Prognosis.—Acute dysentery occurs in this country sporadically, but in tropical climates it presents itself in the form of an epidemic. The prognosis in the sporadic cases is favorable. In the epidemic variety the mortality varies according to the condition of the population attacked, but it not unfrequently reaches 30 per cent. Children, old people, and those previously in ill-health, are more liable than others to succumb to the disease.

Treatment.—In slight cases, such as occur in this country, you will generally find it sufficient to give a dose of calomel and opium, followed by castor oil, so as to clear away any accumulation of fæces that may be producing irritation, If this does not check the complaint, you may administer an enema of starch and laudanum, and cover the abdomen with a large hot poultice. Where there is much pain and great tenderness on pressure, leeches are useful.

You must insist on perfect rest in bed, and restrict your patient to milk, barley water, and farinaceous food.

In acute tropical dysentery you should have recourse to ipecacuanha. It is doubtful how this drug acts, but it is supposed to be beneficial by altering the various excretions poured into the intestinal canal. Dr. Maclean says, "If it is, on account of the irritability of the stomach, determined to prescribe opium, thirty drops of the tincture should be given, and in half an hour followed by from twenty-five to thirty grains of ipecacuanha, which should be given in as small a quantity of fluid as possible. As already advised, the patient should be kept perfectly still,

and abstain from fluid for at least three hours. If thirsty he may suck a little ice, or a tablespoonful of cold water may be allowed. In from eight to ten hours, according to the urgency of the symptoms and the effect produced by the first dose, ipecacuanha in a reduced dose should be repeated with the same precautions as before. The treatment may require to be continued for some days, the medicine being administered in diminished doses, care being taken to allow of a sufficient interval to admit of the patient taking some mild nourishment suited to his disorder." "In malarial dysentery quinine in full doses should be given, not less than a scruple in solution, some time before the ipecacuanha, and repeated until cinchonism, as evidenced by ringing in the ears, is induced. Ipecacuanha and quinine should be given in alternate doses until the characteristic effects of both are produced."

"In scorbutic dysentery our utmost efforts must be directed to improve the condition of the patient's blood. It is in this form of the disease that fresh bael fruit has been found so successful."*

In chronic dysentery, such as we frequently see in this country as the result of the tropical form, the treatment is often very difficult and unsatisfactory. Not unfrequently attacks of a subacute character intervene. Under such circumstances, other treatment should be for a time suspended, and ipecacuanha and opium prescribed.

So long as the stools are watery and frequent, you should restrict the patient to lightly cooked meat, farinaceous food, milk, and other substances that form but little feculent matter. Malt liquors must be prohibited, and, if stimulants are necessary, a small quantity of brandy only should be allowed.

Watch the appearance of the evacuations, and if lumps or knots of fæces present themselves, prescribe small doses of castor oil with laudanum.

You will require opium in almost every case, and it may be given by the mouth or by enema. Astringents are of great value. When the dysentery is of long standing, mineral astringents answer best, especially sulphate of copper (F. 55), acetate of lead (F. 60), or nitrate of silver (F. 52). Many advise

* Reynolds' 'System of Medicine.'

the administration of one of the above drugs in an enema. In more recent and in slight cases, kino, logwood (F. 59), catechu, or tannic acid may be employed.

In most cases of subacute and chronic dysentery it is advisable to irrigate the large intestine. This is done by passing up the rectum a long soft india-rubber tube, and pouring slowly into a funnel attached to it a pint and a half to three pints of tepid water. If any pain is produced, the flow of the water must be checked until it subsides. The water may be used rather colder each day, until the patient can bear it quite cold. In chronic cases a solution of nitrate of silver may be used (4 grs. to 5 oz. of water), or a solution of alum may be employed. Dr. Whittaker has successfully employed three pints of water containing three drachms of common alum, and Dr. Mackenzie, nitrate of silver (3j to Oj of water), in the chronic forms of the disease. We have found both of value, but prefer alum (40 grs. to 1 pint).

You will often find that a case proves rebellious to treatment by astringents. Under such circumstances, ascertain if the attack was ushered in, or was attended by signs of hepatic congestion, and observe if the evacuations seem to be deficient in bile. If so, you may give very small doses of perchloride of mercury along with opium. Or you may discover that the patient was suffering from malaria; when such is the case, begin with one or two drops of the liquor arsenicalis twice a day, and gradually increase the dose. Where there is evidence of scurvy you must prescribe vegetables, fruit, liquid extract of bael, and other means requisite to remove this condition.

The chief complications of dysentery are hæmorrhage, perforation of the intestine, and abscess of the liver. These must be treated as under ordinary conditions.

Asiatic Cholera.

Prognosis.—In every epidemic of cholera there are numerous cases of severe diarrhœa, with or without vomiting, but without collapse, which have been named "*cholerine.*" These for the most part terminate favorably, although some succumb to the disease. The mortality of the collapsed cases is very heavy; it

is especially so among infants, old persons, drunkards, and those who have been previously out of health. The danger in each case is in proportion to the amount of the collapse; the more complete the loss of pulse and the heat of the skin, the greater is the probability of death. You should not ground hopes of recovery on an absence of vomiting and diarrhœa alone, for the strength of the patient may be so much reduced that he is unable to evacuate the fluid with which the gastro-intestinal canal is overloaded. The mortality is generally greater at the beginning of an epidemic than towards its close.

When typhoid symptoms set in, the prognosis must be chiefly determined by the state of the biliary and urinary secretions; if the stools are pale and the urine very scanty, the prospect is unfavorable. Bloody evacuations and hæmatemesis are almost always fatal signs. On the average, 50 per cent. of the collapsed cases perish.

Treatment.—In the slighter cases of choleraic diarrhœa you must prescribe a chalk or acid mixture along with opium (F. 47), and should regulate the diet and attend to the clothing of your patient. But where the stools are frequent and watery you ought to give a dose of opium, and repeat it in an hour if necessary. If the purging still continues, you may administer acetate of lead and opium, either in the shape of pill (F. 60) or mixture (F. 61), and repeat the dose every two or three hours, until the purging ceases or collapse threatens. You may allow small quantities of brandy and farinaceous food in case the pulse seems to require it. Where the stomach is so irritable that it will not retain the medicine, you may administer the opium and acetate of lead by the rectum, or use morphine subcutaneously.

In the stage of collapse it is useless to persevere with astringents and morphine, because where there is no pulse there can be no absorption, and opium, if absorbed, is apt to depress the already feeble action of the heart. In extreme cases abstain even from stimulants, but so long as you can feel the pulse you may administer small doses of ammonia (F. 70), ether (F. 72), or alcohol, watching if any effect be produced on the circulation. Hot bottles should be applied to the feet, and the patient rolled up in hot blankets; but warm baths are useless

and attended with much inconvenience and distress. The cramps, which form one of the chief subjects of complaint, may be relieved by frictions with turpentine or chloroform liniments. If these fail, the subcutaneous injection of morphine, or the inhalation of a small dose of chloroform will often afford temporary relief. Pieces of ice placed in the mouth are grateful to the patient, and he may, if he wishes it, take cold or iced water freely.

The injection of salines into the veins has been largely practised, on the supposition that it would compensate for the loss of fluid from the vascular system. Dr. Latta recommends carbonate of sodium, 60 grains; chloride of sodium, 180 grains, to six pints of water. Schmidt advises chloride of sodium, 60 parts; chlorate of potassium, 6 parts; phosphate of sodium, 3 parts; carbonate of sodium, 20 parts. One hundred and forty grains of this mixture to be dissolved in forty ounces of water, and filtered. The temperature of the injection should be about 108°, and the specific gravity 1004. It should be injected slowly; not above forty or sixty ounces at a time, and not faster than at the rate of two ounces in a minute.*

In the stage of reaction you may give a saline mixture containing chloride of sodium and bicarbonate of sodium, and feed the patient frequently with very small quantities of liquid food. If the bowels are confined, do not use aperients, but employ an enema of warm water.

In the *uræmic* stage be careful not to check too quickly any diarrhœa that may be present, for this is often an effort of nature to remove urea from the system.

Acute Rheumatism.

Prognosis.—The prospect of recovery is favorable; when death takes place it is usually from heart disease, or from a very high temperature attended by delirium. The ordinary duration of the acute stage is about two weeks, but relapses are apt to occur which greatly prolong it. Occasionally, as the acute stage passes off, the patient becomes affected with sub-

* Dr. E. Goodeve, in Reynolds' 'System of Medicine.'

acute or chronic rheumatism. When a person has once suffered from the complaint, he is liable to fresh attacks on exposure to wet or cold.

The acute pericarditis and endocarditis that accompany rheumatic fever seldom end fatally, although they often give rise to morbid changes that may eventually destroy life. Pleurisy and pneumonia, which also are apt to occur as complications, generally subside. Chorea not unfrequently follows the complaint in young subjects, but although often obstinate, it is seldom productive of danger.

Treatment.—Various remedies have been recommended as specifics for acute rheumatism; of these the salicylate of sodium and salicylic acid appear to be the most certain. The former may be given in doses of 15 to 25 grains every six hours (F. 35), and seldom fails to reduce the pulse and temperature within twenty-four or forty-eight hours. If deafness, great depression, nausea, vomiting, delirium, or a slow feeble pulse present themselves the dose must be lessened, or the use of the salicylate given up. If any of these symptoms become threatening, the citrate of caffein is the best means of relieving them. Relapses are, however, very apt to occur after this method of treatment.

Alkaline salts are prescribed by some practitioners, the bicarbonates of sodium and potassium being the most useful; they may be given in doses of thirty grains every four hours, until the urine is rendered alkaline; or thirty grains of the citrate of potassium may be administered every four hours. Salicine is preferred by some to the salicylate of sodium, as being less likely to produce unfavorable effects, whilst others have employed the iodide of potassium and quinine. Dr. Kinnicutt has recommended the oil of winter-green (in doses of ten to fifteen minims) every two hours. Quinine, in two- or three-grain doses every three hours, is another favourite method of treatment, and may be combined with one of the alkalies. In our own experience we have found nothing equal the salicylate of sodium in the certainty and rapidity of its action.

As soon as the temperature is reduced to the normal point, it is useless to persist in the use of the salicylate of sodium, as it does not prevent relapses of the pain and fever. Either the alkaline treatment may be now commenced, or, what we find

more useful, the guaiacum mixture may be prescribed. As a general rule, it is a good plan to examine the tongue and the gums of the patient, in order to direct the treatment. If the tongue is very foul, you had better order one or two doses of calomel, followed by a saline aperient; if it is clean but the gums are swollen and spongy, lemon juice (F. 99) will be found most suitable; if there is marked anæmia, iron in some form will be required.

The patient is obliged, on account of the suffering produced by motion, to remain at rest. He should be kept in bed for six or seven days after the pains and fever have entirely disappeared.

Formerly venesection was generally employed, but its use is now abandoned; leeches are rarely required, on account of the fugitive character of the inflammation of the joints.

Some practitioners advise the affected parts to be wrapped up in cotton wool, but, as a general rule, you will find more relief is afforded by compresses wrung out of cold water or a cold solution of carbonate of sodium, so long as the joints remain hot and swollen. Others apply blisters to each joint as soon as it becomes inflamed. Relief of pain is afforded by any of these applications, but a cold solution of soda is the most beneficial.

When severe pain and tenderness persist in a joint after all the swelling has disappeared, the glycerine of belladonna (F. 196) may be painted on the part night and morning, and seldom fails to lessen the suffering.

If pain and swelling, without much tenderness, continue in a joint after the fever has quite subsided, blistering is the most effectual remedy. It was formerly the custom to give mercury, so as to produce salivation, whenever the heart was affected, but this is now rarely employed. The bowels must be kept open, but severe purging ought to be avoided.

If the temperature is high you must employ frequent cold sponging and the ice-cradle; if the heat of the body be excessive (104° F. or 105° F.), and especially if there be also delirium, the cold bath is required, which must be repeated as often as necessary. The presence of endocarditis or pericarditis is not a contra-indication to the use of the bath, and the delirium often

ceases as soon as the patient is replaced in his bed. It may be requisite to obtain sleep by means of morphine or chloral (F. 108) during the first few nights of the illness; in subacute cases the compound powder of ipecacuanha serves a better purpose.

Pericarditis, endocarditis, pleurisy, pneumonia, and chorea must be treated on general principles.

The diet should be liquid, and consist of milk, beef-tea, and farinaceous food. Lemon juice has been recommended as a specific for acute rheumatism, and may be given freely. If the patient is in the habit of drinking to excess, a moderate amount of alcohol may be allowed, otherwise it should be withheld. It is wise to restrict him to a non-stimulating diet for a week or ten days after the fever has entirely disappeared.

The treatment of subacute rheumatism is the same as that required for the acute form of the disease.

Amer.—Commence with 10 grs. of sodium salicylate combined with 15 grs. of citrate of potassium, every hour for twelve doses, after which give the citrate alone every two hours during the rest of the day. Repeat these in the same way daily, until the pain and temperature have subsided, when only half the above doses should be employed every twenty-four hours for a week longer, after which three 15-gr. doses of each are to be administered every day for another week. In the third week quinine may be given. Circlets of blistering fluid on the affected joints often relieve.

Fr.—The salicylates form the most reliable method of treatment. Where they are contra-indicated aud the temperature is high, tartar emetic should be given. In feeble persons, quiniue may be administered instead of the antimony. In subacute cases, where the salicylates fail, the alkaline treatment should be employed.

Germ.—Salicylic acid should be given in capsules (10 grs.) every hour until about one or two drachms have been administered. The salicylate of sodium is best exhibited in single large doses of one drachm to one drachm and a half. In geueral, the amount should not exceed two and a half drachms in the twenty-four hours; one and a half to two drachms generally suffice.

Gonorrhœal Rheumatism.

Prognosis.—As regards the danger to life, this is more favorable than acute rheumatism. The disease is not liable to affect

the heart, and the fever is less severe; but, on the other hand, the duration is longer, and the patient may remain crippled for months. Stiffness and anchylosis of the joints are more apt to follow gonorrhœal than acute rheumatism.

Treatment.—We have no specific for this form of the disease. The salicylate of sodium, alkalies, and quinine are equally valueless. When the case has become chronic a long course of bichloride of mercury (F. 3) appears to be of most service; cod-liver oil is also valuable. If anæmia present itself, the iodide of iron should be given; and if the appetite fail, recourse must be had to quinine (F. 12) or cinchona (F. 9).

The affected joint should be kept at rest, and, if necessary, supported by a gutta-percha splint. If there are much heat and tenderness a few leeches may be used, followed by hot poultices. In the more chronic cases blisters may be applied; if there is much effusion into the joint, or if there is any thickening, the iodine liniment must be painted on the part. Pressure in the form of an elastic bandage, is of most service when the ligaments are weak and relaxed; but where there is chronic thickening around the joints, strapping with simple or mercurial plaster is indicated.

CHAPTER XVIII.

CONSTITUTIONAL DISEASES FOR WHICH WE POSSESS MEDICINES SUPPOSED TO ACT AS SPECIFICS.

Malarial Fever.

Prognosis.—Although ague is now comparatively rare in most parts of England, you will often meet with it in persons who have been exposed to malaria in other climates. In such individuals sudden changes of temperature or indiscretions in diet are sufficient to provoke an attack. The prognosis in uncomplicated cases is favorable, as we possess in quinine a remedy that is capable of removing the disease. Enlargement of the liver and spleen often follows malarial fevers, and is generally attended with great deterioration of the health. Persons who have resided for a length of time in the tropics occasionally suffer from anæmia produced by malaria. The prognosis of such cases must be determined by the extent to which the general health has suffered. The young usually recover, but the old are not unfrequently incapable of rallying from the disease.

Treatment.—Although we are unable to explain the action of cinchona upon ague, it may be assumed that it in some way removes the poison on which the fever depends. During the cold stage it is sufficient to place the patient in bed, and cover him with warm clothing. No benefit is derived from giving hot liquids or alcohol, or in any other way attempting to force on the hot stage; but some practitioners recommend a dose of opium, as tending to shorten the duration of the fever. In the hot stage you may prescribe effervescing mixtures (F. 89), or if vomiting be troublesome, it can be lessened by the frequent use

of small pieces of ice. In cases where the pain of the head is very severe, some prescribe a moderate dose of morphine combined with the liquor ammoniæ acetatis.

As soon as the sweating stage has subsided, you should commence with quinine. This used to be given in doses of two or three grains every two or three hours, and, although successful in mild attacks, it often failed in severe cases. You are therefore advised to administer ten grains at the end of the sweating stage, and two other doses of equal amount before the time the next fit is expected, the last dose being given two or three hours before the cold stage may be expected to begin. If there is much irritability of the stomach you may combine it with small doses of morphine. If this be insufficient to prevent vomiting, the quinine should be administered in an enema; the rectum ought to be first washed out with some warm water, and then fifteen grains should be injected, along with four ounces of beef-tea. Some have recommended the subcutaneous injection of quinine, in which case the dose should vary from half a grain to two grains. The objection to this is that inflammation of the skin, followed by ulceration, is sometimes produced.

If the tongue is very foul a dose of calomel is often of service, and where you have reason to suspect the stomach to be overloaded, you may administer an emetic of ipecacuanha. Where the disease does not readily yield to quinine, an emetic, given an hour before the expected attack, often acts very beneficially.

In children, an attack is sometimes ushered in by convulsions, which must be treated by means of bromide of potassium, or chloral, or, in very severe cases, by the inhalation of chloroform. Adults occasionally become comatose, and under such circumstances, in addition to stimulants, a large dose of quinine must be administered by the mouth, or by enema.

When the fits have been prevented, it is useful to continue smaller doses of quinine for a week or two, taking care that the bowels are kept freely open. Sometimes the quinine fails, and we are then advised by Dr. Maclean to act upon the patient's liver by means of taraxacum or podophyllin (F. 162), returning in a week or two to the use of quinine. In chronic and very obstinate cases, where quinine seems to be ineffectual, you can

often give arsenic with success. The dose must be gradually increased from six to thirteen drops two or three times a day, watching for any symptoms that show it is acting injuriously.

The sulphate of beberine has been strongly recommended in ague, but it is much less reliable than quinine; the eucalyptus has been of late also employed as a specific, but its efficacy seems open to great doubt. Warburg's tincture is a favourite with many practitioners; it is said to contain quinine, camphor, opium, rhubarb, and aloes. It often acts as a powerful sudorific.

In the treatment of the neuralgia arising from malaria, arsenic is more valuable than quinine, although it is always advisable first to try the latter. We have known valerianate of quinine efficacious in the case of females.

When typhoid occurs in a person suffering from malaria the course of the disease is often greatly altered. In such cases it is a good plan to commence the treatment with quinine. We have found a greater liability to relapses than in the ordinary typhoid fever of this country, and after the first relapse have seen arsenic, in moderate doses, more beneficial than any other method of treatment.

In malarial anæmia you should advise the patient to leave the district in which he has contracted the fever. A combination of iron and quinine (F. 199), along with a liberal diet and a moderate amount of wine, form the best treatment. Easton's syrup (F. 228) is a useful preparation in such cases. In enlarged spleen, the external application of the biniodide of mercury ointment has been strongly recommended. "A portion about the size of a nutmeg is applied on the part with a smooth spatula, and the patient is directed to sit before the fire so as to let the ointment dry into the skin." Dr. Maclean states "that in some cases where the spleen has extended down into the pelvis it has after several applications been reduced almost to its normal limits."

Syphilis.

Prognosis.—It is often of the greatest importance to discover if a person suffering from a chronic disorder has been affected with the venereal disease. You will frequently have to depend

upon your own observation to ascertain this, for circumstances may induce the patient to deny the fact. Syphilis is always a dangerous malady, as it is apt to give rise to morbid changes in various internal organs, as well as to deteriorate the vital power. The prognosis is more unfavorable in infants and in old persons than in those in the prime of life; individuals of a scrofulous habit, those who are affected with any serious organic disease, and such as have led a life of dissipation, are unfavorable subjects for it.

The prognosis in the tertiary forms must be determined by the organ affected, and the extent to which its functions have been interfered with. As a general rule, the discovery of a syphilitic origin for a disease of any internal organ is a favorable circumstance, as we possess remedies capable of restraining the inflammatory action arising from this cause.

Treatment.—The treatment during the primary stage is generally considered to belong to the surgeon, and need not be described. In the secondary, and more especially in the tertiary period, the case usually comes beneath medical care, and therefore requires our attention.

Various drugs have been at different periods employed for the cure of syphilis, but in the present day confidence is reposed only in mercury and iodine. How these act is undetermined, but that they have the power of controlling any inflammatory action induced by the disorder is generally admitted.

Mercury is employed both in the primary and secondary stages, but its value is chiefly seen in those affections that have recently followed the primary infection; in fact, the greater the distance of time from the primary sore the less is mercury to be trusted for relieving syphilitic manifestations. It is most successful in the sore throat and eruption of the secondary stage, least useful in the paralytic attacks and periosteal nodes that present themselves in the later periods. The presence of cachexia does not necessarily forbid its use, for this condition is not unfrequently the consequence of the syphilitic poison. Under such circumstances the patient ought to be carefully watched, and his strength should be supported by a liberal diet and other measures calculated to improve his general health. Mercury may be introduced into the system either by the mouth or

through the skin. In the former case blue pill is a convenient form, which may be given in doses of four or five grains twice a day, or if there is much irritation of the bowels, five or six grains of the Hydrarg. c. Cretâ, along with Dover's powder, may be substituted. Calomel is a favourite with many practitioners, and may be prescribed in the form of five or ten grains of the compound calomel pill every night. Others prefer the bichloride of mercury, in doses varying from one twentieth to one tenth of a grain (F. 4), twice a day, taken shortly after food. Any of these preparations may produce irritation of the bowels, in which case small doses of opium may be combined with them.

Some physicians prefer the introduction of mercury through the skin, so as to avoid the derangement of the digestion to which the ordinary method of administration is apt to give rise. For this purpose, half a drachm of the mercurial ointment may be rubbed into the inner part of the thighs or arms every night, the skin being well cleansed with soap and water before the inunction, and the ointment being allowed to remain on the part until the next evening. The subcutaneous injection of the bichloride has been employed, but is seldom now practised, on account of the irritation apt to be excited by it.

The use of calomel by means of the vapour-bath has been strongly recommended, more especially in the treatment of cutaneous eruptions. Mr. Lee gives the following directions for its use :—"The most convenient calomel vapour-bath, and that which is now generally used, is one which was made at my request by Mr. Blaise (see Fig. 35). In this apparatus the lamp which sublimes the calomel boils the water at the same time. In the centre of the top, immediately over the wick of the lamp, is a small separate circular tin plate, upon which the calomel is placed. Around this is a circular depression, which may be one third filled with boiling water. The apparatus is then placed on the ground, and the lamp is lighted. The patient sits over it, with an American cloth cloak or a mackintosh or a moleskin cloak fastened round his neck. He thus becomes surrounded by calomel vapour, which he is generally directed to inhale for two or three separate minutes during each bath. In doing this the patient should not put his head under the cloak, but simply

allow some of the vapour to escape from its upper part, and breathe it mixed with a large proportion of common air. At

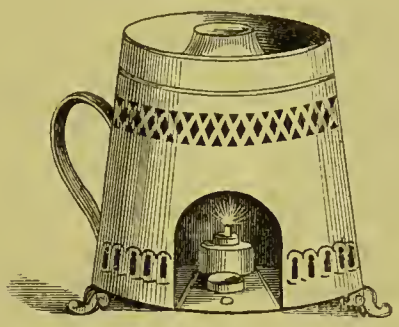


Fig. 35.

the expiration of a quarter of an hour or twenty minutes the calomel has volatilised, and the water has boiled away. A portion of the calomel is deposited, together with the condensed vapour of the steam, on the patient's body, and is there to be left. The quantity of spirits of wine to be used on each occasion is so regulated that the lamp goes out of its own accord about the same time as the calomel disappears. The patient then gradually unfastens the cloak, and in about a minute he is sufficiently cool to put his night-dress on without much interfering with the very fine layer of calomel which covers his body. He must be particularly told not to wipe his skin, as by so doing he would necessarily interfere with the action of the medicine.*

In a prolonged course of mercury it is important to prevent an undue action on the gums. For this purpose the mouth should be well rinsed out with warm water, in which some tincture of myrrh or other astringent has been mixed. The teeth should be brushed twice a day very carefully, and five or ten grains of chlorate of potassium should be taken three or four times a day, either in water or along with the food. The patient should also give up smoking, as this is apt to increase the tendency to inflammation of the gums.

Iodine is prescribed for the cure of the tertiary symptoms in preference to mercury; iodide of potassium being the salt gene-

* Holmes' 'System of Surgery.'

rally selected. You may begin with five grains two or three times a day. It is advisable, when large doses are given, to administer it along with carbonate of ammonium in half a tumblerful of water shortly after food. If five grains prove insufficient to relieve, the dose may be gradually increased; and in some cases thirty grains are given with good results where smaller quantities have failed. If the digestion is imperfect, you may combine it with calumba or cinchona, or if much anæmia be present, with some form of iron.

In many cases you will find it beneficial to combine mercury and iodine, or you may follow a course of the mercury by one of iodide of potassium.

Where the general health of the patient has suffered from a course of mercury, you may use sarsaparilla or guaiacum with advantage. The compound decoction of sarsaparilla is often of great value in such cases, and may be combined with acids or other tonic remedies.

Although the employment of the above drugs constitutes the chief point in the treatment, the state of the digestive organs should be always watched. The diet should be carefully regulated, and all indigestible substances avoided. A fair proportion of animal food may be given, and, if the patient seems cachectic, or his former habits appear to require it, a moderate amount of alcohol should be allowed.

Diarrhœa is apt to occur from the irritation of the mercury, and must be restrained, lest the patient's general health be depressed. The clothing should be warm, and chills or exposure to wet carefully avoided during a mercurial course.

Gout.

This disease may present itself in an acute or chronic form. The term "irregular gout" is employed by some writers to designate various affections occurring in those predisposed to this complaint, but in whom there is no articular inflammation. Besides the joints, gout is apt to affect the skin, throat, bronchial tubes, digestive organs, and the nervous system. Consequently, we often meet with eczema, sore throat, bronchitis,

dyspepsia, and sciatica, arising from this cause. In the present day there is a tendency to attribute to it almost any chronic malady that may show itself in a person of middle or advanced age. This error should be avoided, and you should look upon these cases only as "gouty," in which you have evidence either of previous attacks of articular inflammation, or of an imperfect excretion of uric acid. A close relationship has long been recognised between the formation of renal calculi and gout, and, of late years, it has been shown that it is one of the most common causes of contracting kidney.

Prognosis.—The prognosis of an acute attack is favorable. In the chronic form there is often serious derangement of the general health, and the patient may die of diseased kidneys. As regards the prospect of preventing the attacks, acquired gout is more favorable than when it is hereditary, and the prognosis is better when the patient has the first fit of the disease in middle or advanced age. In the chronic form the joints are apt to be stiffened, or even anchylosed by the deposits of urate of sodium.

Acute Gout.

Treatment.—In colchicum we possess a remedy that seldom fails to relieve gouty inflammation. We are unable satisfactorily to explain the way in which it acts, but it is supposed to soothe the vascular and nervous systems. It may be given in doses varying from ten to thirty minims of the tincture every six hours, but it is most conveniently prescribed in combination with alkalies (F. 13). Bicarbonate of potassium, sodium, or magnesium is usually preferred when there is much acidity in the stomach or intestines, whilst citrate of potassium or magnesium is more useful where the urine is scanty and high-coloured.

The affected limb should be raised; in sharp attacks the patient should be confined to bed, and in all cases the bowels should be kept open. If the tongue is very foul, a moderate dose of calomel (F. 161) or blue pill (F. 160), followed by a saline aperient, is required; but if such is not the case, it will

be sufficient to order a dose of Carlsbad or Friedrichshall water, or tartarated soda every morning.

Various means may be employed to relieve the pain. Formerly leeches were much used, but in the present day they are universally condemned, as tending to induce stiffness of the affected joint. Dr. Garrod recommends that "some carded cotton should be wrapped around the joint, and oil-silk or gutta percha so applied that the moisture is retained, and by this means a kind of vapour-bath is formed." The pain is usually worse at night, and, where sleep is prevented, a dose of morphine may be given. The use of chloral is condemned by some, unless a dose of soda or potash be administered at the same time.

Dr. Garrod recommends the application of morphine and atropine where the pain is very severe, "in the proportion of one grain of atropine and eight grains of hydrochlorate of morphine to an ounce of spirit and water; a small piece of lint may be dipped in the solution and placed on the part, and covered with oil-silk. The tinctures of belladonna and opium may be used, but the solution of the alkaloids is more cleanly and elegant." We have often found a saturated solution of the citrate of lithium, combined with morphine, very useful in affording relief. This lotion should be applied on a piece of lint covered with oil-silk.

During the attack the patient should be restricted to liquid food, and all alcoholic drinks avoided, unless there be some special reason for giving them.

Amer.—In acute gout let the patient be restricted to milk and farinaceous food, and in slight cases diuretics and aperients may be prescribed. When the attack is more severe, colchicum should be administered, in combination with sulphate of magnesium and small doses of opium. When the acute symptoms have disappeared, quinine and small doses of colocynth may be substituted. Locally, alkaline and anodyne lotions afford relief. In the subacute cases, salicine and the oil of winter-green may be employed with benefit.

Fr.—In severe attacks, colchicum should be given followed by quinine, and when the pain is very severe, salicylate of sodium is useful.

Germ.—The affected joint should be wrapped up in wool, and the limb retained in an elevated position. Formerly colchicum was relied upon,

but of late it has not been much used. Subcutaneous injections of morphia should be given to relieve the pain. When there is much gastric disturbance, the bicarbonate of sodium or magnesium will be found useful.

Chronic Gout.

The discovery of any circumstance that tends to excite an attack is, of course, of primary importance. The disease is believed to consist in the presence of an abnormal quantity of urate of sodium in the circulation. This may arise from some derangement of the digestion, which produces an excess of this salt, or which lessens the alkalinity of the blood so that it more readily separates from it; or it may result from an imperfect elimination of uric acid from a defective action of the skin or kidneys. The most common preventable causes are errors in diet, such as an undue amount of animal food, or the abuse of alcoholic liquors, insufficient exercise, and mental anxiety. The absorption of lead also produces a tendency to gout.

When the patient is otherwise in good health, small doses of colchicum and alkalies may be employed during the exacerbations of the gout. Colchicum is not of much use in very chronic cases besides which it is apt, when long continued, to disorder the digestion. Guaiacum is beneficial in the asthenic gout of old people, and may be safely continued for many months, the ammoniated tincture being best suited for this purpose. Whenever there is marked anæmia you must have recourse to iron; otherwise most cases require quinine (F. 215), or some other bitter. When the absorption of lead seems to have produced the disease, a long course of iodide of potassium (F. 8) is beneficial; indeed, it may be given in combination with cinchona in any very chronic case.

The regulation of the diet is of primary importance. Animal food should be taken only once a day, and late dinners avoided. Pork, veal, rich dishes, much fat, and sauces and pickles should be prohibited, as well as any article of food that is known to disagree with the patient. The stronger wines and malt liquors must not be taken, and if it is necessary to allow alcohol, a small quantity of whisky or brandy, well diluted, should be

preferred. Tea and coffee usually disagree, more especially the latter.

As the complaint is almost always associated with dyspepsia, special attention should be directed to the digestive organs. Acidity is a common cause of complaint, and requires appropriate treatment. Regular exercise in the open air should be insisted upon.

One or other of the excreting organs is usually defective in its action. In a large proportion of cases the activity of the skin is impaired, and the use of Turkish or vapour baths is indicated, or, where these cannot be obtained, the patient should daily rub the skin briskly with a coarse towel or glove. The bowels must be carefully regulated. If the patient is plethoric, Carlsbad, Friedrichshall, or some other mineral water may be taken each morning; but if he is at all anæmic, a mild dinner pill or electuary (F. 132) will answer the purpose better. When the urine is scanty and high-coloured, you may prescribe the citrate or bicarbonate of potassium, or carbonate of lithium; in some cases the phosphate of ammonium is useful.

Where the patient is plethoric, you must be careful not to check too suddenly any loss of blood to which he may be liable, as, for instance, bleeding from piles, as an occasional depletion of the vascular system, if not excessive, frequently seems to afford relief.

The joints are often left weak or stiff after repeated attacks of gout. Under these circumstances internal remedies are not of much value. If there is no thickening of the tissues, the use of an elastic bandage or stocking, and regular frictions with some stimulating liniment, will prove useful. If one of the larger joints contains liquid, repeated small blisters are of service. When the surrounding structures of a large joint are much thickened, frictions of iodine or the application of the iodine liniment often improves its condition. If the thickening be situated in the foot or hand, a number of the contiguous articulations being affected together with the surrounding fibrous tissue, you should strap the part either with ordinary plaster, or with mercurial plaster spread on leather.

Scurvy.

Prognosis.—A well-marked case is scarcely ever seen in the present day, excepting where there has been a deficiency of fresh vegetables during a sea voyage. On account of its comparative rarity, you may easily mistake or overlook slight cases that may present themselves. The prognosis is favorable, unless there be extreme feebleness of the heart or profuse hæmorrhages. Hæmorrhagic inflammation of the pericardium and pleura occasionally occurs. Death sometimes takes place from a sudden failure of the heart, even in cases that do not appear to be severe.

Treatment.—As a deficiency of vegetable food is the cause of scurvy, the treatment consists in supplying it. Fresh fruit or vegetables, such as lemons, oranges, apples, potatoes, cabbages, dandelion, and lettuce may be used. Uncooked potatoes are a favourite and effectual remedy with sailors. Where the fresh vegetables cannot be obtained, four to eight ounces of lemon juice should be given daily. In addition to fruit and vegetables, a liberal allowance of fresh animal food, along with milk and malt liquors, should be prescribed. Where dysentery is associated with scurvy, the bael fruit is valuable.

Various tonics may be given, if there be any failure of the appetite; quinine and acids (F. 217), or iron and quinine (F. 199), being the most useful. If the bowels are constipated mild aperients may be prescribed, but all severe purgatives must be avoided, as they are apt to give rise to hæmorrhage from the intestines.

If there is an offensive smell from the mouth a lotion of carbolic acid or permanganate of potassium may be used; and where there is much swelling of the gums, they should be touched daily with nitrate of silver. If diarrhœa is troublesome, it ought to be restrained with bismuth and opium (F. 25). In pericarditis or pleurisy, care must be taken not to employ measures likely to reduce the heart's action, and the use of vegetables, fruits, and acids should be continued.

Anæmia.

This is one of the most common morbid conditions, and its early recognition and treatment are of the greatest importance. It probably consists in a diminution in the number of the red blood-globules, but in most cases the amount of albumen is also lessened. As the blood supplies nutriment to every structure, and as the oxygen is conveyed by the red corpuscles, you will readily understand how important it is in every disease to correct such a condition.

You distinguish anæmia by the pallor of the lips, throat, and conjunctivæ. You must not trust to the appearance of the skin, for some persons, who are naturally florid, present a considerable amount of colour in the cheeks, when the mucous membranes are perfectly white. You can generally hear a systolic murmur at the base of the heart, and in severe cases a continuous murmur over the jugular veins.

Anæmia presents itself whenever there has been a greater waste of blood than the blood-forming organs have been able to replace. 1. It occurs after almost every acute febrile disease. You will often see, even in a few days, after an attack of scarlatina, that the lips of the patient have become pale; towards the termination of long-standing fevers, such as typhoid, it is usually well marked, and the deficiency of blood is one of the chief causes of the slow recovery of the patient. 2. Wherever there has been very rapid growth, either of the body as a whole, as often occurs at puberty, or of a single structure, as in the case of cancerous tumours, it is a prominent symptom. 3. It presents itself when there has been a long-continued drain upon the system. For example, in women who have nursed their children for an undue length of time, in those who suffer from excessive menstrual discharge or leucorrhœa, and in persons who have been affected with chronic diarrhœa, dysentery, albuminuria, or bronchitis. 4. It attains its highest grade wherever there is an important structural change in any of the blood-making organs, as in chronic atrophy of the stomach, or hypertrophy of the spleen or lymphatic glands. 5. It also arises from

the long-continued absorption of lead, mercury, and arsenic, and it is not uncommon in chronic cases of syphilis and gout.

The prognosis of anæmia depends chiefly upon the cause producing it. It is always unfavorable in any structural disease of the blood-forming organs, as most of these affections are incurable.

In "*pernicious anæmia*" the progress of the disease is usually slow, the patient gradually loses strength and colour, the breathing becomes difficult, and attacks of vomiting or diarrhœa are apt to occur. A high temperature in such cases is always an unfavorable sign, and often precedes a fatal termination. Although in some cases the disease appears to have been arrested, the prospect of recovery is usually very unfavorable.

Treatment.—The first and most important point is to ascertain the cause of the anæmia, and, as far as possible, to remove it. Where, for example, it has arisen from undue lactation, leucorrhœa, or piles, treatment directed to check the drain from the vascular system is usually sufficient to restore the patient to health.

In every case it is important to supply the patient with a sufficient amount of albuminous material. If the appetite is good and the powers of digestion are unimpaired, you should prescribe a liberal quantity of animal food. Always remember, however, that the amount of blood depends, not on what the patient eats, but on what he can digest and assimilate. If, as is so often the case, the stomach is feeble, you should give soup, broth, milk, eggs, and other kinds of liquid nourishment, in preference to solid food. You must also see that the diet comprises enough vegetable and starchy materials to maintain health. Some form of alcohol is almost always useful; when rapid growth is going on malt liquors are most beneficial, but in old persons, or in those who are inclined to become stout, wine is more readily digested.

In every case you ought to ascertain if the digestive organs are capable of performing their functions. If there be gastric catarrh, indicated by a foul tongue, acidity after meals, heartburn, constipation, and high-coloured urine, you will do harm by forcing food upon the patient. First correct the disorder of

the stomach, and then, and not until then, prescribe liberal diet and stimulants.

The bowels are often constipated, for their muscular coat participates in the general feebleness. Be careful not to employ drastic or saline purgatives, for these drain away serum from the already impoverished vascular system. You should prescribe aloes, in small and repeated doses (F. 158), or laxative medicines (F. 132), or, if necessary, combine these with tonics.

Fresh air is as important as food, and the elimination of the effete materials by the lungs should be encouraged by exercise. When circumstances permit, a residence at the sea-side is invaluable in promoting the formation of blood.

We need not remind you that the red blood-globules contain a large proportion of iron. This mineral is as much a specific for anæmia as cinchona is for ague, or mercury and iodine for syphilis. It must be given in sufficient doses, and should be continued for some time. You should select your preparation according to the effect you wish to produce. If an astringent is necessary, as in leucorrhœa, the tincture of the perchloride may be chosen (F. 200); where the stomach is irritable you may prescribe it in an effervescent form (F. 198), or the ammonio-citrate (F. 201) or saccharated carbonate may answer the purpose; if the digestion is imperfect from atony of the stomach you should prefer the acid phosphate or the lacto-phosphate; whilst if the appetite is bad you may combine with it quinine (F. 199), beberine, quassia, calumba, or some other bitter. Remember to keep the bowels freely open when you give iron.

In some cases iron will not agree. Manganese, zinc (F. 233), and arsenic have been proposed as substitutes, but they are much inferior to it. They should be taken after food, and ought to be continued for a length of time.

In "*pernicious anæmia*" iron and manganese are rarely of any use; on the contrary, they often bring on vomiting or diarrhœa. A long course of arsenic, with or without the addition of a vegetable bitter, constitutes the only treatment that is of much value. The food must be nutritious and digestible, the patient should be protected from cold, and all mental or bodily fatigue should be strictly prohibited.

CHAPTER XIX.

CONSTITUTIONAL DISEASES FOR WHICH WE POSSESS NO SPECIFICS.

Rheumatoid Arthritis.

Prognosis.—As regards danger to life the prognosis is favorable, those affected by it often living to extreme old age. It neither produces heart disease, like acute rheumatism, nor contracting kidney, as is the case in gout, and its injurious effects are generally limited to the joints attacked. The senile form is usually incurable, but in younger persons the progress of the disease is not unfrequently arrested, at any rate for a considerable period.

Treatment.—We have no medicine capable of curing the disease. As it frequently follows a long-continued or excessive discharge, such as leucorrhœa or uterine hæmorrhage, these should be checked when they are present. If the patient is anæmic iron should be given, with or without quinine (F. 228). Cod-liver oil is especially valuable when there is much emaciation, and should be administered, in small doses, for a considerable length of time. In most cases iodine is useful; it may be prescribed along with quinine (F. 9), or with lemon-juice. The tincture of iodine (about 10 or 15 minims), largely diluted with water, is a favourite remedy with some practitioners, but it must be continued for a long time in order to be of service. When anæmia is present, the syrup of the iodide of iron should be preferred. Where other remedies have failed arsenic (F. 2) may be tried, as it sometimes improves the general health, and lessens the affection of the joints. Guaiacum is another drug often employed, the ammoniated tincture being the most con-

venient form. Whichever of these remedies you may select, it should be used for a length of time and in small doses.

Some practitioners apply the continuous galvanic current, for the purpose of relieving pain and maintaining the tone of the muscles of the affected limbs.

In acute attacks, salicylate of sodium, combined with quinine, may be given with advantage, and liniments containing opium or belladonna, or hot fomentations sprinkled over with these drugs, or the glycerine of belladonna, may be applied to the painful parts.

The diet must be of a different kind from that required in gout. A liberal amount of animal food is requisite, and fat may be taken with advantage, or a nutritious soup should be given where the appetite is defective. Most patients require some form of alcoholic stimulant; porter and ale are beneficial, or, where these do not agree, port wine or burgundy may be substituted.

The digestive organs generally require tonics, such as quinine (F. 215), gentian, calumba, or nux vomica (F. 211). The bowels must be carefully regulated, but all severe purgatives should be avoided.

In the earlier stage of the joint affection, the application of iodine or of small blisters is of service. Complete rest tends to produce stiffness, so that a moderate amount of exercise should be encouraged.

Amer.—Any abnormal state should be treated. In the female, special attention should be directed to any defect or excess in menstruation; or to leucorrhœa, or any other discharge likely to affect the general health. Whenever the symptoms are acute, salicylate of sodium should be given, or if there is much debility, the salicylate of quinine. The iodide of potassium or the tincture of iodine may be prescribed in the more chronic cases, especially when the pains are increased at night. If the nutrition is much impaired, arsenic, iodide of iron, quinine, and cod-liver oil are indicated. Hot baths are of value, and when the disease has become chronic, massage and galvanism should be used to the joints.

Fr.—In acute or subacute attacks, the salicylate of sodium may be prescribed, but it has no power to arrest the progress of the disease. During the early period of the complaint, iodine and arsenic are useful. In chronic cases, hot baths, baths of arsenic, or baths of turpentine

vapour may be employed, whilst electricity should be applied to the affected joints.

Germ.—Reliance can be only placed on the local treatment of the joint. The salicylate of sodium is only of use in acute attacks, and has no effect on the progress of the disease. Massage is often very useful, but electricity is chiefly to be trusted, the continued current being applied to the joints, the faradic to the atrophied muscles.

Rickets.

Prognosis.—The prospect of recovery is good when the disease commences in children after the first year of age; the earlier the age of the child who is attacked by it the greater is the danger. Unfavorable cases are usually the result of bronchial catarrh, the softened ribs preventing the due expansion of the lungs. Spasmodic croup is apt to occur in rickety children, and is liable to cause death.

Treatment.—The two most common premonitory symptoms are diarrhœa and profuse perspirations. Whether we regard these as the causes or the effects of the rickets we should always direct our attention to restrain them. Diarrhœa may be treated by a mixture of soda, rhubarb, and calumba, together with the administration of an occasional dose of castor oil, syrup of senna, or tincture of rhubarb, mercurials being carefully avoided. As soon as the diarrhœa has ceased you may prescribe pepsin along with acids, or extract of cinchona, or sarsaparilla. Young children should be fed on milk mixed with lime water; those that are older on beef tea or veal or chicken broth and farinaceous food. The perspirations may be relieved by sponging with sea water, or with water in which common salt has been dissolved.

As soon as the gastric and intestinal catarrh have subsided all your efforts must be directed to improve the child's nutrition. Animal food may be allowed once or twice a day according to the age of the patient. Some recommend uncooked beef, but the chance of tapeworm being introduced should not be lost sight of. Vegetables, milk, and farinaceous food may be given, and if the patient seem to require it a small quantity of wine should be prescribed.

Many look upon cod-liver oil as a specific, and it is certainly valuable in most cases; it should be administered in small doses and continued for a length of time. Iron is usually prescribed, and may be given in the form of steel wine, syrup of phosphate of iron, lacto-phosphate of lime and iron, or iodide of iron, according to circumstances. If the appetite is bad you may add quinine or calumba. The bowels must be regulated, but no severe purgative should be allowed. Change of air and sea-bathing are of great value.

For some length of time lime should be given in the form of lime water; the phosphate of lime is preferred by some practitioners.

Every means should be adopted to prevent curvatures of the bones. Rickety children should sleep on mattresses, and high pillows should be forbidden; they must not be allowed to walk until the bones are strong enough; and in the case of infants the nurse should be directed not to carry them exclusively on one arm. Slight curvatures of the limbs are generally repaired as the firmness of the bones increases.

Purpura.

Hæmorrhage into the skin or from the mucous membranes may occur in any disease in which either the blood or the walls of the vessels are in an abnormal condition. 1. It may follow various febrile disorders, such as diphtheria, scarlatina, &c. 2. It may result from disease of any of the eliminating organs, and, consequently, it is a symptom of acute atrophy of the liver and of jaundice. 3. It occurs when any arrest has taken place in the development of the blood, as in splenic enlargement and leucocythæmia. 4. It presents itself when the walls of the smaller arteries and capillaries are in an abnormal state, as in lardaceous disease and in chronic atrophy of the kidneys. But we also meet with hæmorrhage into the skin and from the mucous membranes without any apparent cause, and such cases are classed under the head of purpura.

An ordinary case of purpura generally ends favorably within two or three weeks, but you should be always cautious in your

prognosis, because hæmorrhage from the mucous membranes may become so profuse as to cause death in cases that, at first sight, appear to be trifling.

Treatment.—It is an advantage to keep the patient as quiet as possible, as we thereby lessen the chance of bleeding taking place into any important organ. Formerly venesection was employed, but this is now generally condemned. When the pulse is full the bowels should be kept open by means of sulphate of sodium or sulphate of magnesium, along with quinine and sulphuric acid.

Various astringent remedies have been recommended. Sulphuric acid was formerly prescribed in every case; latterly ergot, given internally or injected subcutaneously, has been a favourite remedy. Others use acetate of lead (F. 61) or gallic acid (F. 45); the oil of turpentine, in doses of 1 to 4 drachms, has been given, either by the mouth or by enema; the tincture of larch (10 or 15 minims every four hours) has been used with advantage; perchloride of iron, in half-drachm doses, is a favourite remedy, but are not generally successful. We have found arsenic by far the most satisfactory drug, especially in the more chronic cases.

Leucocythæmia.

Prognosis.—The prognosis is generally unfavorable, although some cases recover. The probability of improvement is greater when severe hæmorrhages are absent, when the diminution in the numbers of the red globules and the increase of the white blood-cells is not very great, and where the patient has come under treatment at an early period.

Treatment.—Persons affected with leucocythæmia who have been exposed to malaria should be removed at once to a more healthy locality, and quinine must be prescribed. In most chronic cases a long course of arsenic is beneficial, and may be given alone or in combination with quinine. Iron, strychnine, and other tonics may be used; phosphorus has been strongly recommended for the purpose of improving the general health. Various means have been employed to reduce the size of the

spleen. The swelling has been rubbed with the iodide of mercury ointment, the continued galvanic current has been applied to the organ, and subcutaneous injections of ergotine have been made, in the hope of inducing contraction. The spleen has been removed in a considerable number of cases, but hitherto the operation has terminated fatally.

Hodgkin's Disease.

Prognosis.—The course of the disease is usually slow, but occasionally it occurs in an acute form. Death generally results from exhaustion, occasionally from hæmorrhage, or from a co-existing affection of some important organ. Sometimes the glands appear to lessen in size, whilst in other cases they cease to increase and the general health is not much affected.

Treatment.—The most important point is to improve the general health; the diet should be nutritious, regular exercise should be taken in the open air, and the patient protected from cold and wet. Iron, quinine, or other tonics may be prescribed according to the necessities of the case. Phosphorus has been recommended by some, as a means of reducing the size of the glands; others have more confidence in a long course of arsenic.

Disease of the Supra-renal Capsules. (Addison's Disease.)

Prognosis.—The disease seems always to terminate fatally, and we have no means by which we can check its progress. It should, however, be remembered that in some cases there is no bronzing of the skin, and that this symptom may occur in other diseases as well as in affections of the supra-renal bodies.

Treatment.—The general health must be attended to, a nutritious diet should be prescribed, and severe mental or bodily exertion strictly forbidden. Tonics are usually of advantage, but no drug seems to be of special benefit in this complaint. Symptoms must be treated as they arise.

Diabetes Mellitus.

Prognosis.—The presence of sugar in the urine is an alarming symptom, and the prospect is, as a general rule, unfavorable. You should ascertain if it is always present, for it may be only occasionally excreted, disappearing when the diet is altered or indigestion overcome, or it may accompany or follow hooping-cough or other disorders.

A form of diabetes occurs in old people, especially in those who are stout, that often lasts for very many years without apparent detriment to the general health. The amount of sugar in such cases is small, the specific gravity of the urine is not much above the normal standard, and there is but little thirst or emaciation.

The form of the disease which is most apt to occur in young or middle-aged persons is much more serious, as it is attended with a great increase in the quantity of the urine, which contains a large amount of sugar, and it is accompanied with rapid emaciation, loss of strength, great thirst, and often a ravenous appetite. Under these circumstances life is seldom protracted beyond three or four years, and most die within twelve or eighteen months. The younger the patient, the more unfavorable is the prospect of recovery.

A large proportion of diabetics die of phthisis, others are cut off suddenly by coma or exhaustion; boils and carbuncles are another source of danger to such patients. In fact, all who are affected with diabetes hold life by a slender thread, and death is apt to be brought about by an amount of fatigue or exertion that would be readily borne by those who are in perfect health. Attacks of any inflammation, such as pneumonia or pleurisy, are accompanied by great danger.

Treatment.—Unfortunately we are not certain as to the organ affected, and we have no remedy for diabetes. Every article in the Pharmacopœia has at one time or another been supposed capable of curing it, but there is none in which we can place confidence. Tonics of all kinds, such as quinine, strychnine, and arsenic, have been used unavailingly. They are, however,

of use in the diabetes of old people, when the appetite begins to fail, or the strength is much reduced. Dilute nitric acid was formerly a favourite remedy. In the young, iron and cod-liver oil are of service by supporting the strength, but they have no effect in lessening the amount of sugar. In some cases diabetes presents itself in persons who have formerly suffered from malaria, and in such a lengthened course of quinine or of arsenic should be given.

Various alteratives have been employed, such as iodine and bromine. They are of no value,—indeed, they seem generally to increase the quantity of sugar in the urine. We have seen good effects from the salicylate of sodium, and in many slight cases the benefit is decided, but where severe headache presents itself it should be discontinued. Alkalies were formerly much used, but they are chiefly to be employed in gouty cases, in which deposits of uric acid are frequently observed in the urine. Iodoform has been recommended (in doses of one and a half to four and a half grains), but its usefulness seems to be doubtful.

Opium is of use in lessening the amount of the sugar and diminishing the irritability of the patient. It may be given in doses of half a grain two or three times a day, or a corresponding dose of morphine may be substituted. Some prefer codeine (one quarter of a grain gradually increased), regarding it as effective as opium, whilst it is less apt to constipate.

Lactic acid has been prescribed, on the supposition that in a state of health sugar is transformed into this substance, but that this does not occur in diabetes. We have not found this treatment of any use.

In persons suffering from diabetes you should examine the chest carefully from time to time, as the physical signs of phthisis are often not well marked, and the only indication of pulmonary mischief may be a rise in the temperature towards the evening. Although the prognosis is under such circumstances very unfavorable, the treatment requires no alteration. When the patient has been attacked by sudden exhaustion he should be kept in bed, and food and stimulants must be freely given.

When a tendency to diabetic coma is shown by a decided increase in the acidity, or a sudden diminution in the amount of

the urine, the patient must be confined to bed, alkalies should be given, and the excretion of the skin encouraged by the use of hot or vapour baths.

The treatment of diabetic coma is usually very unsatisfactory. Some advise the use of hot baths, others active aperients ; we have in most cases prescribed diuretics, as there is often a sudden decrease in the quantity of sugar excreted. Injections into the veins of a weak solution of the chloride and phosphate of sodium have been strongly recommended. Patients so treated have sometimes recovered their consciousness for a time, but, according to our experience, death has always taken place in a day or two. Dr. Ralfe recommends the injection to be composed of 0·1 per cent. of sodium carbonate and 0·5 per cent. of neutral sodium phosphate.

The treatment of diabetes mainly consists in confining the patient to a diet that contains very little starch or sugar. For example, bran bread, almond cake, or gluten bread must be substituted for wheaten bread, and potatoes and farinaceous food should be avoided.

A diet composed only of skimmed milk has been strongly recommended, but it is not of much use in a severe case. It may be tried in the early stage of the more chronic cases, and it is advisable to commence with four ounces of the milk every two hours during the daytime, the quantity being quickly increased to eight ounces. It should be given slightly warmed, and if the patient is unable to digest it, peptonised milk may be tried.

The action of the skin ought to be maintained by the use of warm or vapour baths, the patient being clothed in flannel, and care taken to avoid exposure to wet or cold.

The following is one of the most useful dietaries you can prescribe :

BREAKFAST.

Milk, whey, coffee, tea, bran or gluten bread, butter, bacon, ham, eggs, animal food of any kind.

DINNER.

Beef, mutton, pork, veal, fish of any kind, birds of any kind ; soups, if made with the vegetables afterwards named, and with-

out flour, rice, sago, &c., beef-tea; cabbage, cauliflower, broccoli sprouts, sea-kale, spinach, celery, lettuce, turnip tops, onions, nuts excepting chestnuts, watercress, cheese, curds, crabs, lobsters, oysters; claret wine, brandy, rum.

Tea and Supper

may be made of any of the above kinds of food.

No farinaceous food or bread should be taken, excepting bran or gluten bread. The thirst is best relieved by carrying about a bottle filled with milk and lime water, the patient taking a sip as often as required, but it is wise to take as small a quantity of liquid as possible.

In many of the cases occurring in old persons, the sugar lessens or disappears as soon as starch and sugar have been rigidly excluded from the diet. When it has been absent for a few weeks, the patient may be allowed to take a moderate amount of toast with his breakfast and supper, and, if no return of the sugar is noticed, the strictness of the diet may be gradually relaxed.

Diabetes Insipidus.

A form of disease is described under this name, in which a large quantity of urine is discharged, of low specific gravity, but free from albumen or sugar, attended with dryness of the skin, thirst, and emaciation. It is not unusual for urine of this character to be passed temporarily in cases of hysteria and other nervous diseases, but these complaints are readily distinguished by their other symptoms. In fatal cases various morbid conditions have been discovered; in some there has been an affection of the brain, in others of the kidneys, the bladder, or prostate gland, whilst a history of syphilis or malaria has led to the idea that the disease may have occasionally resulted from one of these disorders. Although the diuresis is not unfrequently controlled, eventual cure is not often the result of medical treatment.

Treatment.—When a distinct history of syphilis can be obtained, the patient should be subjected to a course of mercury

or iodide of potassium, or if there is much debility, the iodide of iron may be prescribed. In malarial cases quinine or arsenic, or both combined, should be used. Valerian has been prescribed in large doses, and apparently with advantage; some prefer the tincture, others the valerianate of zinc (three grains for a dose). Opium has not proved so useful as in diabetes mellitus; belladonna has failed in improving the condition of the patient. Ergot has been recommended in doses of half a drachm to one drachm of the liquid extract, and has appeared to be of more use than most of the other drugs that have been employed. Nitro-glycerine, in doses of $\frac{1}{100}$ gr., often reduces the quantity of urine, but its administration for a length of time is apt to produce gastric disturbance.

The diet does not require to be altered, as in diabetes mellitus, but alcoholic stimulants should be avoided as much as possible. The action of the skin must be maintained by means of hot and vapour baths, and the patient should be clothed in flannel. A certain amount of success is said to have followed the application of blisters to the epigastrium, and also the employment of a constant galvanic current from the loins to the epigastrium.

Myxœdema.

Prognosis.—The disease usually occurs in women of middle age. The fatal result is often postponed for many years, and death ensues either from some intercurrent affection, such as pneumonia, or from gradual exhaustion. In many instances the kidneys become the seat of chronic parenchymatos inflammation, and the patient may then succumb to dropsy or uræmia.

Treatment.—**A.** The well-known fact that the disease is associated with atrophy of the thyroid gland suggested the idea that the administration of this tissue might possibly exercise some retarding influence upon the course of the complaint. The first attempt in this direction was undertaken by Merklen, who grafted a lobe of a sheep's thyroid into the submaxillary region of a case of myxœdema with beneficial results. Further experience has led to the adoption of simpler methods of utilising the thyroid secretion. Mr. Murray administers the thyroid

juice by subcutaneous injection, and gives the following directions for its manufacture :—" The lobe of a thyroid gland of a sheep is excised as soon as possible after the animal has been killed and the surrounding fat and connective tissue are removed from it. All the instruments and glass vessels used in further preparation of the extract should be either sterilised by heat, or thoroughly cleansed with a 1 in 20 solution of carbolic acid. The gland is cut in pieces in a glass dish, and then placed in a test-tube with 1 c.c. of pure glycerine and 1 c.c. of a 0·5 per cent. solution of carbolic acid. The mouth of the tube is then closed with cotton wool, and the mixture allowed to stand in a cool place for twenty-four hours. The mixture is now placed in a fine handkerchief previously left for a few minutes in boiling water. It is then firmly squeezed so as to express as much fluid as possible through the handkerchief. By this means 3 c.c. of a turbid pink fluid are obtained. It is best to make the extract fresh each week, so as to avoid the risk of putrefaction taking place. Two injections are given each week, 1·5 c.c. being used on each occasion." The hypodermic syringe must be preserved in a strictly aseptic condition, and the dose gradually decreased as time progresses.

The thyroid gland is sometimes given by the mouth, the raw tissue being eaten in the form of a sandwich. It may also be administered in the form of a desiccated powder. In all cases the symptoms which follow its administration must be carefully watched, and if the patient complain of palpitation, sickness, or throbbing in the head, the dose of the gland should be reduced.

D. Regular exercise in the open air should be allowed, but all bodily fatigue forbidden. The patient should dress warmly, and if possible habitually wear flannel or lamb's-wool clothing next the skin. Exposure to cold and damp must be carefully avoided, as renal mischief is very apt to complicate the disease.

B. The diet should be nutritious, and a small amount of stimulant may be allowed if signs of cardiac failure show themselves. Tonics are usually required in cases where the appetite is feeble, the milder preparations of iron, with or without quinine, being the most valuable. If the symptoms of weak digestion are present, the mineral acids along with pepsin after meals are extremely serviceable.

CHAPTER XX.

DIET AND REGIMEN IN CHRONIC DISEASES.

Chronic Heart Disease.

If there be no co-existing dyspepsia, the patient may be allowed to choose those articles of diet that he has found by experience to agree best with him. In most cases it is useful for him to dine in the middle of the day, the latest meal being moderate in quantity, and not taken within three hours of the time he retires to rest. At supper he should avoid soup, vegetables, fruit, and other articles of food likely to produce flatulence during the night.

A large amount of liquid must be prohibited, and especially effervescing drinks. Coffee, strong tea, and tobacco should not be used, as they are liable to excite the action of the heart. It is better also for him to abstain from alcohol, but if this cannot be done, a small quantity of wine, or well-diluted spirit, may be allowed with the meals.

Care should be taken that the bowels act daily, and the patient should be warned not to strain when at stool.

Exercise in the open air ought to be taken whenever the state of the weather permits, but hurry, excitement, climbing of hills, running, or playing at games must be forbidden.

Severe mental exertion must be especially avoided, and a moderate amount of time should be spent in sleep. In cases of regurgitant aortic disease, some recommend that the patient should sleep with the head very low, so as to obviate the necessity of much cardiac action.

The clothing ought to be warm, but not so heavy as to encumber the patient by its weight, and so render exercise laborious.

Warm sponging may be used each day, but he should not be permitted to use hot baths, Turkish or vapour baths, or sea-bathing.

Chronic Bronchitis and Phthisis.

If there is neither dyspepsia nor diarrhœa the diet does not require to be strictly regulated, the chief object being to supply the patient with as much food as he is capable of digesting. All nutritious and fatty substances may be indulged in, such as fresh milk, eggs, bacon, soup, &c. The food ought to be taken at regular times, and should not be given between meals so long as the appetite remains good. A moderate amount of wine or malt liquor may be allowed, but it is wise for the patient to avoid spirits. Some phthisical subjects suffer from a complete loss of appetite, and under such circumstances they should be induced to take frequently, and in moderate quantities, milk, butter, koumiss, eggs, soup, or farinaceous food. The use of tobacco is apt to increase the cough and spoil the appetite.

Regular exercise out of doors should be taken whenever it is practicable, but excessive exertion must be avoided; riding or driving is usually beneficial. When the air is cold or damp a respirator should be worn.

Tepid baths, or cold baths in the summer, ought to be used daily, and the water may be mixed with salt to increase its stimulating effect on the skin. The clothing should be warm, and all undue exposure to wet or cold must be avoided.

It is a great advantage for the patient to reside, during the spring and winter, in some locality where he is able to take regular exercise in the open air without risk of catching cold.

The advantages to be derived from a change of climate by those suffering from diseases of the lungs are so generally recognised, that the practitioner is constantly called upon to advise as to the locality which should be chosen. Under such circumstances he has to take into consideration not merely the state of the atmosphere of the situation to be selected, but also its water-supply and drainage, as well as the food and accommodation likely to be obtained. From the absence of some of the conditions necessary for the comfort or convenience of patients in

places otherwise favorably situated, the choice is usually restricted to localities situated at a high altitude, such as Davos or St. Moritz; to those on the shores of the Mediterranean; to islands possessing a warm, moist climate, such as Madeira; or to a sea voyage of considerable duration.

Experience proves that in certain cases, not only is benefit not likely to be derived from a change of climate, but that the course of the disease is apt to be rendered more rapid, by the fatigue and exposure necessarily involved in travelling from home. Whenever in a case of phthisis the temperature is high and the pulse quick, it is wise to forbid the patient undertaking a journey; and where there is great emaciation and muscular feebleness it is very improbable that any change of climate will prove beneficial.

Dr. Williams very properly remarks that "there are a certain number of cases which may be put out of consideration, where the best of climates can avail nothing, such as cases of acute tuberculosis, tuberculo-pneumonic phthisis, laryngeal phthisis, acute phthisis, as well as cases accompanied by continuous pyrexia, or in which the processes of tubercularisation or excavation are actively proceeding; also advanced phthisis accompanied by intestinal ulceration and albuminuria."*

Dr. Weber lays down the following conditions, in which the climatic treatment by *high altitudes* is indicated.

1. The *disposition* to phthisis, whether hereditary or acquired. 2. Cases of catarrhal or pneumonic infiltration of the apices. 3. Cases of pneumonic exudation, either of the upper or lower lobes, without great weakness of heart, senility, or Bright's disease. 4. Chronic bronchial catarrh of the lower lobes, unless the above-named complications or emphysema be present. 5. Cases of pleuritic exudation. 6. Caseous deposits. 7. Uncomplicated chronic hoarseness (laryngeal catarrh). 8. Cases with a tendency to hæmoptysis.

The conditions *not suited to mountain climates* are—1. Most cases of organic heart disease or disease of the arteries. 2. Cases of chronic catarrh with considerable dilatation of the bronchi and emphysema. 3. Cases of epilepsy. 4. Rheumatic affections and convalescence from rheumatic fever. 5. A con-

* 'Pulmonary Consumption,' by C. J. B. Williams, M.D., and Charles Theodore Williams, M.D.

siderable degree of constitutional weakness, with inability to bear wind, cold, and changes of temperature. 6. Persons advanced in years do not bear mountain climates.*

Dr. Williams states that the *Mediterranean climates* are especially adapted—1. For cases of phthisis complicated with inflammatory affections of the lungs. 2. Chronic tubercular phthisis in all stages, if devoid of pyrexia, and provided the patients are able to take active exercise. *They are contra-indicated* in hæmorrhagic phthisis, the so-called erethric forms, especially when accompanied by anorexia, and all cases of phthisis in which there is regular pyrexia.

He also states that "for catarrhal phthisis the climate of Madeira is unsurpassed, the irritable cough becomes softer and less frequent, the expectoration freer, and the whole respiratory tract seems soothed and rendered less irritative by the mild atmosphere."

According to the same authority, the *cases best suited for sea voyages are*—1. Hæmorrhagic phthisis. 2. Scrofulous phthisis, especially where fistula has been developed. 3. Cases of limited consolidation or cavity, where, without pyrexia, the cough is hard and obstinate. 4. Cases of phthisis and emphysema. 5. Cases where, in addition to limited tubercular disease, the patients have been overworked in mind or body.

Atonic Dyspepsia.

A more or less feeble state of the digestion is common amongst persons who appear to be otherwise healthy and capable of actively engaging in the ordinary duties of life. Whenever there is an hereditary tendency, the worries and cares of business are almost certain to induce it, and unless the patient carefully regulates his habits and diet, the symptoms are apt to be aggravated as his age increases.

The symptoms of dyspepsia arise from the amount of the gastric juice secreted being insufficient to dissolve the food introduced into the stomach, so that fermentation takes place in

* Von Ziemssen's 'Handbook of General Therapeutics;' 'Climate,' by Dr. Hermann Weber.

it. The most obvious means, therefore, of counteracting dyspepsia must be to improve the general health of the patient, in order that a larger quantity of the gastric juice may be secreted, only such articles of diet being taken as can be most readily digested.

There are certain circumstances connected with the habits of the patient that require careful regulation.

It is the general custom to take a certain amount of solid food three times a day, and experience seems to prove that this arrangement is that which is best fitted to maintain the health under the conditions of modern life. The midday meal is, however, often neglected by men engaged in active occupations, and in consequence the stomach becomes fatigued, and is unable to digest at a late hour. On the other hand, some dyspeptics are in the habit of taking food too frequently, so that the organ never obtains sufficient repose. In either case the patient must be reminded that the digestion is certain to be injured, either by lengthened fasts, or by a too frequent repetition of the meals.

Slow and perfect mastication of the food is equally important, in order that the gastric juice may come into contact with every particle that is swallowed. The process of cooking is intended to soften the food, so that it may be more readily dissolved, and the greatest care must be taken that every article intended for the dyspeptic should be rendered as easy of mastication as possible.

The various kinds of animal food differ in the facility with which they are digested, according to the tenderness of their fibres, and the amount of the fatty or oily matters they contain. In consequence of this, the smaller fish, such as the whiting, sole, plaice, and haddock, are better fitted for the dyspeptic than those that have harder fibres, such as the cod, ling, halibut, or turbot. The oily fishes—the salmon, mackerel, eel, and herring—must be avoided. Uncooked oysters generally agree, whilst the harder shellfish, such as the crab, shrimp, and lobster, are difficult of digestion.

For the same reasons, the chicken, partridge, pheasant, grouse, young pigeons, and turkey can be readily taken, whilst the goose and duck are apt to give rise to indigestion on account of the large amount of fat they contain.

The rabbit and hare usually agree. Mutton, if lean, is more digestible than the richer kinds of meat, such as pork and beef; whilst the flesh of young animals—as, for instance veal and lamb —are tougher, and therefore less fitted for dyspeptics than the same animals when more mature. Lean tripe and the thymus and pancreas of the calf digest readily, but the heart, liver, and kidneys are unsuited for a feeble digestion.

The fatty kinds of food, although they are not digested by the stomach, are apt to undergo decomposition if they are long retained in this organ. A small quantity of fresh butter or bacon does not generally disagree, but a large amount must be avoided. These usually cause less inconvenience at breakfast than at the later meals.

The saccharine and starchy materials of the food are not acted upon by the gastric juice, consequently they might be expected to be especially fitted for the dietary of a person suffering from dyspepsia. In practice, however, they are found to produce flatulence, so that such articles must be used only in moderate quantities. Rice, semolina, vermicelli, or well-boiled macaroni, generally agree better than arrowroot, sago, or tapioca. Bread should not be eaten when it is new, as when stale, and therefore dry, it is more readily acted upon by the secretion of the stomach. Aërated bread, rusks, and toast are well fitted for a weak digestion.

The woody parts of vegetables are very insoluble in the gastric juice, consequently these articles of diet differ according to the proportion of cellulose they contain. The potato is, therefore, often the only vegetable that will agree; in other cases sea-kale, cauliflour, new green peas, vegetable marrow, French beans, boiled celery, and beetroot can be taken without much difficulty, even when the turnip, carrot, or cabbage will provoke an attack of indigestion. All uncooked vegetables, such as lettuce, radishes, &c., must be avoided.

Raw fruits, with the exception of grapes, rarely agree, but well-cooked apples can be often digested without much difficulty. Dried or preserved fruits, on account of their toughness, and all nuts, from the quantity of oily material they contain, should be rejected. When the patient has been forbidden to indulge in vegetables for a length of time, he should be allowed

to take fresh lemon juice, squeezed over his food, in order to prevent any tendency to scurvy.

As a general rule, only a small quantity of liquid should be allowed at meals, as a large amount is apt to dilute the gastric juice so greatly as to lessen its action on the food. For the same reason, the patient had better abstain from soup and broth. Effervescing liquids are also to be forbidden, since they are apt to distend the stomach and intestines with gas. Cocoa or weak tea is to be preferred to coffee. In most instances it is advisable for the patient to abstain from alcohol, but where this cannot be done, a small quantity of brandy, whisky, or dry sherry may be taken at meal-time.

Daily exercise in the open air, either by walking or riding, is essential for all persons suffering from a feeble state of the digestion, but it is advisable to avoid exertion immediately before or shortly after a meal. Whenever it is practicable travelling is invaluable.

Sea-bathing in the summer is usually beneficial, and at other times a cold or tepid bath should be used daily, or the skin should be sponged with water containing sea-salt in solution. The clothing ought to be warm, and suited to the climate and state of the weather.

Dyspepsia attended with Excessive Flatulence.

The diet in these cases requires to be modified, although the rules already given for improving the general health of the patient must be insisted on.

Only a moderate amount of animal food should be allowed, and the chief meal ought, if possible, to be taken in the middle of the day. Fish, and especially the larger and richer kinds, do not agree as well as chicken and game.

Farinaceous food may be taken in moderation, but large quantities should be carefully avoided. This is especially the case as regards bread, an excessive amount of which is often the cause of this form of dyspepsia. Toast, rusks, or biscuits usually agree better than bread made with yeast; whole meal or brown bread is in most cases injurious. In many instances a charcoal biscuit, taken after meals, is useful.

All vegetables and fruit, either raw or cooked, should be abstained from so long as the symptoms are urgent; but as soon as the digestion improves, trial may be made of well-cooked apples, asparagus, spinach, sea-kale, or boiled celery; potatoes, peas, beans, turnip, carrot, artichoke, and parsnip must be avoided.

Liquids should be allowed only in small quantities, and all effervescing drinks must be prohibited. Soup and broth are almost always injurious. Coffee, dandelion coffee, or cocoa, made from the nibs, is more suitable than tea. Milk may be taken in moderation, but not in large quantities. Malt liquors, and all wines, are apt to produce flatulence, and if a stimulant is necessary, a small quantity of brandy or whisky may be taken with the meals.

Dyspepsia attended with Great Acidity.

Most of the cases in which acidity is a prominent symptom are connected with chronic inflammation of the mucous membrane of the stomach. The saccharine, farinaceous and fatty materials readily acidify, and should be therefore avoided.

Mutton and fowls usually digest more easily than beef, and the patient can often take meat when it is cold better than when it is hot. Veal and lamb not unfrequently agree, but pork, the goose and duck should be forbidden. The richer kinds of fish, such as the turbot and salmon, are unsuitable, oysters are apt to produce acidity, but in some cases the claws of the lobster and crab seem to digest tolerably well.

Butter, cream, and sugar must be prohibited, or used sparingly; bacon generally disagrees.

Ordinary yeasted bread is unsuitable, but toast, aërated bread, or rusks may be taken in moderation. The patient should avoid light puddings, pastry, and other articles composed mainly of starch.

Well-boiled vegetables, such as cabbage, spinach, sea-kale, &c., may be used; but the potato, turnip, carrot, parsnip, and beet-root should be forbidden. Uncooked vegetables sometimes agree, and lettuce not unfrequently relieves heartburn. Grapes,

cooked apples or pears in many cases are of use, but other kinds of fruit should not be indulged in.

Coffee, cocoa, or tea ought not to be used, but the patient may take a moderate quantity of milk, mixed with Vichy water or lime water. Ale and porter are always injurious; it is advisable that alcohol, in all forms, should be avoided, but where this cannot be done, a small quantity of whisky, mixed with Vichy water, may be allowed. A tumblerful of hot water, taken early in the morning, and repeated once or twice a day, an hour after meals, often affords considerable relief.

Chronic Constipation.

Under normal conditions, such constituents of the food as resist the action of the digestive fluids act as stimulants to the muscular coat of the intestines; consequently the diet requires to be regulated on a different principle from that laid down in the treatment of atonic dyspepsia.

Animal food should be used sparingly, never more than twice a day, for no inconsiderable proportion of the cases of constipation arise from an undue consumption of this kind of diet. As far as possible, fowls, game, fish, soup, or broth should be substituted for beef and mutton. Various kinds of shellfish, and especially oysters, will be found of service.

Unless the patient is inclined to corpulence, bacon, butter, and other fatty materials may be allowed, but an excessive amount of milk must be forbidden.

Saccharine substances, such as treacle, marmalade, or fruit jams, may be employed, either at breakfast, or at any other meal the patient may prefer.

Articles chiefly composed of starch are constipating, and should be used as little as possible. "Whole meal" or brown bread should be substituted for white bread and biscuit; puddings and pastry must be prohibited.

All kinds of vegetables may be indulged in, but those containing a large proportion of cellulose, such as the cabbage, lettuce, spinach, &c., are to be preferred. Uncooked vegetables may be taken if the patient is not liable to excessive flatulence.

Fruits are exceedingly useful, and many who suffer from constipation at other periods of the year are relieved from their trouble during the summer, when fresh fruit is plentiful. Preserved fruits, such as figs, prunes, &c., are valuable, and are most beneficial when taken in the early morning.

Hot water taken in the early morning promotes the action of the bowels. Coffee is more aperient than cocoa or tea. Soup or broth may be indulged in with benefit. Where there is no contra-indication, a moderate amount of malt liquor may be drunk along with meals; in other cases claret, or some light wine, may be tried. The more astringent wines, such as port, must be forbidden.

Exercise in the open air ought to be encouraged, and walking, riding, driving, gymnastics, or games involving considerable muscular exertion should be recommended.

Sea-bathing in the summer, or tepid and cold salt-bathing at other times of the year, assists in maintaining the tone of the muscular structures of the intestines and of the abdominal walls.

Chronic Diarrhœa.

In very obstinate cases, it is often necessary to restrict the patient for some time to a diet composed of milk, eggs, and farinaceous food, but generally it is sufficient to make these the chief articles of his diet.

Rabbit, game, fowls, and the smaller kinds of fish are to be preferred to beef and mutton, but hare can seldom be taken with impunity. All sauces, condiments, and pickles must be strictly forbidden.

Bacon or other food containing much fat should be avoided, but milk, eggs, and cream, if they agree, may be freely indulged in.

Saccharine materials, such as treacle, marmalade, preserved fruits, or jams, must not be used. White bread or biscuit is to be preferred to the whole meal or brown bread. All forms of farinaceous food may be taken, but pastry should be prohibited.

Vegetables of every kind, whether cooked or raw, and fruit in

every form must be avoided, but as soon as the patient improves, a well-boiled potato or beetroot may be cautiously tried.

Soup or broth should not be allowed. Cocoa or weak tea is to be preferred to coffee, and a moderate amount of brandy, diluted with water or "Orezza water," may be taken at meals; wines and malt liquors must be avoided.

The amount of exercise ought to be moderate, and fatigue or exposure to cold carefully guarded against. The clothing should be warm, and a bandage of silk or flannel must be constantly worn around the abdomen.

Persons suffering from Obesity.

All articles consisting mainly of fat, sugar, or starch should be withdrawn from the dietary, the quantity taken at each meal should be moderate, and liquids sparingly indulged in. Lean animal food may be used in moderation, and lamb, veal, or lean mutton should be preferred to beef and pork. Fowls and fish may be used, with the exception of those containing much fat or oily matter. Shellfish, with the exception of the interior of the crab and lobster, may be eaten. Butter, bacon, eggs, and cream should be expunged from the dietary, and milk only allowed in moderate quantity.

Saccharine materials, such as treacle, jams, marmalade, &c., must not be indulged in.

Whole meal or brown bread should be substituted for the finer kinds of bread, and should be eaten well toasted. All farinaceous articles of food, such as pastry, puddings, &c., must be forbidden.

Potato, turnip, carrot, beetroot, and parsnip should be avoided; but all other kinds of vegetables, such as salads, cabbage, onion, tomato, celery, spinach, &c., may be freely indulged in.

Fruits that are sweet must be used in moderation, but apples, pears, grapes, and such like fruits may enter into the patient's dietary.

The amount of liquid ought to be moderate; tea and coffee may be used, but cocoa had better be avoided. Alcohol should

be prohibited, but if this is not practicable, claret and hock may be allowed in moderate quantity. Vichy water, or any other alkaline water, may be drunk at meals.

Exercise in the open air ought to be taken as freely as possible, and boating, riding, and out-of-door games recommended.

A daily bath of water containing salt or vinegar may be had recourse to, and the Turkish bath or vapour-bath should be used if it is found to agree with the patient.

Many persons are in the habit of resorting yearly to one of the foreign baths, and the practitioner will find the following remarks of Immermann of use in enabling him to select those that are most likely to be beneficial:

"The waters of low temperature and containing Glauber's salts and sulphuric acid are also rich in bicarbonate of soda, and owe the greater part of their universal celebrity to the circumstance that at these watering-places so many fat people every year find their trouble diminished or removed, and can go home, after a few weeks' use of the waters, considerably slenderer and several pounds lighter.

"In the treatment of corpulence we give the *crenæ* (or cold springs) containing Glauber's salts the preference over the *thermæ*. Marienbad, for instance, over Carlsbad, which lies near it; this is principally on account of the possible danger of apoplexy or syncope, which is to be feared from the strongly stimulating and over-exciting nature of the hot mineral water on the heart, whilst that purgative effect which we desire above all is a property possessed just as much, or in fact in even a higher degree, by the *crenæ* (Marienbad, Tarasp), than by the *thermæ* (Carlsbad, Vichy).

"Pasty individuals, whose pale countenances and habit, in other respects, lead us to conclude that, in all probability, a certain amount of oligocythæmia is present, at any rate feel themselves, as a rule, after a short use of great quantities of this strongly purgative mineral water, extraordinarily languid and exhausted. Under these circumstances it is better to choose alkaline waters of which the laxative effect is slighter, while they contain iron and therefore possess distinctly tonic properties. Franzensbad, Elstor, Kissingen, &c., *with their chalybeate-alkaline waters*, enjoy as favorable a reputation in anæmic as Marienbad

in plethoric corpulence. In Tarasp, finally, both kinds of healing springs are united."*

Chronic Diseases of the Liver.

The amount of animal food should be small, and when it is practicable the chief meal should be in the middle of the day.

Fat of all kinds is injurious, and, consequently, lamb, veal, fowls, game, fish, and shell-fish are preferable to beef and mutton. Milk should be used only in moderation, and pork, bacon, butter, cream, and eggs forbidden.

All saccharine materials, such as sugar, marmalade, jams, &c., must be prohibited. Brown or whole meal bread is better fitted for such cases than that made from the finer kinds of flour; it should be eaten well toasted, and only a moderate quantity should be allowed. The starchy articles of diet, such as rice, arrowroot, sago, &c., must be avoided.

Vegetables not containing starch should constitute the main portion of the diet, and should be well boiled. Consequently the patient may indulge freely in cabbage of all kinds, celery, lettuce, sea-kale, vegetable marrow, tomatoes, &c., whilst he refrains from potato, parsnip, carrot, peas, broad beans, and other vegetables containing starch or sugar.

Rich soup should be condemned, and tea is better fitted for these cases than coffee or cocoa, When it is practicable, alcohol should not be used, and especially spirits, malt liquors, or the stronger wines. When a stimulant is required, claret, hock, or a light dry sherry may be allowed.

All condiments, such as pepper, mustard, pickles, &c., must be forbidden.

The patient should be daily in the open air, and take as much exercise as he is able. Riding on horseback, driving, sailing, and rowing are especially valuable. He should limit the hours spent in sleep, and ought to retire to rest and rise early. The daily use of a tepid bath, or warm sponge-bath, is of considerable benefit, and it is useful to dissolve sea-salt or vinegar in the water.

* "Immermann on Corpulence," 'Ziemssen's Cyclopædia of the Practice of Medicine.'

Chronic Kidney Disease.

If there is much anæmia, the diet should be simple but nutritious, containing a moderate amount of animal food. In other cases it is useful for the patient to restrict himself mainly to fowls, game, and fish, taking beef or mutton only occasionally.

Farinaceous food, bread, vegetables, and fruit may be eaten at each meal, in case there is no dyspepsia or other contra-indicating circumstance.

Weak tea is preferable to coffee or cocoa; skimmed milk may be used freely at each meal if desired. Alcohol should be forbidden, but if it is found to be necessary, a light claret or hock should be preferred to the stronger wines. Distilled, or some other kind of very pure water should be used wherever the drinking-water contains much lime or iron.

The patient must be advised to take regular exercise in the open air, but fatigue or any undue exertion, either bodily or mental, must be forbidden.

Attention to the state of the skin is of primary importance, and the patient should be most carefully protected from all exposure to wet or cold. He must be clothed in flannel, and wear warm underclothing, even in the summer. Warm baths, vapour-baths, or the Turkish bath may be employed, but the greatest care should be enjoined against exposure to cold air immediately afterwards. A sea voyage is very valuable, and often affords more relief than any other measure.

When it is practicable, the patient will derive great advantage from a residence in a warm and dry climate during the winter, and, if he is unable to leave the country, he should select a sheltered locality for his residence.

Chronic Gout.

The various methods that have been proposed for the prevention of gout by a very rigid diet, such as one composed ex-

clusively of milk or vegetables, are seldom successful, as the strength of the patient is apt to be so much reduced that the attacks become more frequent and severe. It is advisable that a moderate amount of animal food be taken daily, but it should be restricted to the midday meal, the supper consisting only of some light and digestible materials.

Lean and tender beef or mutton, poultry, the white kinds of fish, such as sole, whiting, haddock, or cod, should be preferred to veal, pork, salted meat, and the richer kinds of fish, such as salmon, eel, mackerel, or herring.

Bacon or an egg may be taken at breakfast, if they agree with the patient, but sugar, cream, or much butter should be avoided.

All sweets, such as marmalade, treacle, and jams, ought to be excluded from the dietary.

Bread should be eaten stale or toasted ; farinaceous food may be taken in moderation, but pastry of all kinds should be forbidden.

Potato, cabbage, spinach, asparagus, and vegetables of the same kind may be indulged in ; but the turnip, carrot, parsnip, &c., must be used with caution.

Stone fruits and raw apples and pears should not be eaten, but well-cooked apples and pears, as well as strawberries, grapes, oranges, and the acid fruits, such as gooseberries, currants, &c., may be used in moderation.

Wines and malt liquors should not be permitted, but if alcohol of some kind is requisite, a small quantity of well-diluted brandy, whisky, or gin may be drunk along with the meals.

Tea and coffee may be used, but they should be weak, and if they disagree, cocoa made from the nibs may be tried.

Exercise in the open air is most important, and should be taken daily ; riding on horseback is invaluable in preventing attacks. If the patient is unable to walk, carriage exercise may be substituted, or, if this cannot be obtained, the limbs should be carefully and regularly rubbed. Where it is possible to select a residence, a bracing and somewhat elevated locality should be chosen.

The greatest care should be enjoined to prevent cold; the patient must be clothed in flannel, and the feet protected from damp. The action of the skin ought to be assisted by the use

of warm baths or of sponging with warm water, the limbs being subsequently well rubbed with a coarse towel.

Late hours must be avoided, and the patient, as far as possible, should guard himself from mental excitement.

Gouty patients are constantly sent to various mineral waters both at home and abroad, and often with very unsatisfactory results. The following remarks on this subject by Sir A. Garrod will be found valuable :

"They [mineral waters] should be altogether prohibited when there is considerable structural disease in any important organ, especially in the heart or kidneys ; and even when the organic mischief is slight, the greatest caution is necessary in their use.

"They should be avoided when an acute attack is either present or threatening.

"The waters should be selected according to the nature of the case. When the patient is robust and of full habit, the alkaline saline springs (Vichy, Wiesbaden) ; when torpidity of the bowels predominates, the purgative waters (Carlsbad, Homburg) ; when there is a want of vascular action, the saline waters ; when the skin is inactive, the sulphur springs (Aix-la-Chapelle, Aix-les-Bains, Barèges, Luchon) ; lastly, when debility prevails, then the more simple thermal waters should be chosen (Wildbad, Teplitz, Gastein, Buxton, Bath).

"In all cases caution is necessary at the commencement of a course of mineral waters, and care should be taken not to oppress the stomach by giving too much liquid, nor to induce debility or any other injurious effects by allowing a too long sojourn in the bath.

"In conclusion, I may add that, although great benefit is undoubtedly often obtained from a sojourn at these Spas, yet too much must not be expected from the exhibition of mineral waters, as their influence, even when most advantageous, endures but for a comparatively short time, whereas the causes of the disease are, in many cases, in constant operation." *

* 'A Treatise on Gout and Rheumatic Gout,' by Sir Alfred Garrod, M.D., F.R.S.

FORMULÆ.

The doses are for adults, unless otherwise specified.

I.—ALTERATIVES.

1. Liq. Arsenicalis, 3 mins.; Tincture of Hop, 30 mins.; Infusion of Quassia, 1 oz.

2. Liq. Arsenicalis, 3 mins.; Syrup, 30 mins.; Comp. Tincture of Cardamoms, 30 mins.; Water to 1 oz.

3. Corrosive Sublimate, $\frac{1}{12}$ gr.; Tincture of Bark, 60 mins.; Tincture of Rhubarb, 30 mins.; Water, 1 oz.

4. Liq. Hydr. Perchlor., 1 fl. dr.; Aquæ Destil., 1 oz.

5. Solution of Perchloride of Mercury, 1 dr.; Iodide of Potassium, 5 grs.; Infusion of Quassia, 1 oz.

6. Grey Powder, $2\frac{1}{2}$ grs.; Dover's Powder, $2\frac{1}{2}$ grs.; Confection of Hips, q. s. To make one pill.

7. Blue Pill, 4 grs.; Opium, $\frac{1}{4}$ gr. To make one pill.

8. Iodide of Potassium, 4 grs.; Bicarbonate of Potassium, 7 grs.; Tincture of Henbane, 20 mins.; Decoction of Cinchona, 1 oz.

9. Iodide of Potassium, 4 grs.; Fresh Lemon Juice, $\frac{1}{2}$ oz.; Decoction of Cinchona, 1 oz.

10. Bromide of Potassium, 12 grs.; Liq. Potassæ, 15 mins.; Water, 1 oz.

11. Iodide of Potassium, 5 grs.; Infusion of Quassia, 1 oz.

12. Tincture of Quinine, 1 dr.; Syrup of Iodide of Iron, 30 mins.; Infusion of Calumba, 1 oz.

13. Wine of Colchicum, 10 mins.; Carbonate of Magnesia, 10 grs.; Bicarbonate of Potassium, 10 grs.; Water, 1 oz.

14. Wine of Colchicum, 20 mins.; Carbonate of Magnesia, 8 grs.; Tincture of Opium, 5 mins.; Sulphate of Magnesia, 40 grs.; Water to 1 oz.

15. Succ. Taraxaci, 1 dr.; Bicarbonate of Sodium, 10 grs.; Spirit of Chloroform, 10 mins.; Tincture of Orange, 30 mins.; Infusion of Rhubarb, 1 oz.

II.—ANTACIDS.

16. Bicarbonate of Potassium, 30 grs.; Water, 1 oz.

17. Citrate of Potassium, 20 grs.; Salicyclate of Sodium, 10 grs.; Water, 1 oz.

18. Bicarbonate of Sodium, 15 grs.; Aromatic Spirit of Ammonia, 30 mins.; Spirit of Chloroform, 20 mins.; Infusion of Cloves, 1 oz.

19. Carbonate of Ammonium, 5 grs.; Infusion of Chiretta, 1 oz.

20. Solution of Potash, 15 mins.; Mucilaginous Mixture, 1 oz.

21. Carbonate of Maguesium, 15 grs.; Bicarbonate of Sodium, 15 grs.; Infusion of Serpentary, 1 oz.

22. Bicarbonate of Sodium, 15 grs.; Carbonate of Ammonium, 5 grs.; Succ. Taraxaci, 1 dr.; Comp. Tincture of Cardamoms, 30 mins.; Peppermint Water, 1 oz.

23. Carbonate of Maguesium, 7 grs.; Carbonate of Ammonium, 3 grs.; Compound Tincture of Lavender, 30 mins.; Syrup of Ginger, 30 mins.; Peppermint Water, 1 oz.

24. Citrate of Lithium, 10 grs.; Citric Acid, 20 grs.; Syrup of Orange, 30 mins.; Water, 2 oz. To be taken in a state of effervescence with 14 grs. of bicarbonate of sodium dissolved in 1 oz. of water.

25. Carbouate of Bismuth, 10 grs.; Bicarbonate of Sodium, 10 grs.; Comp. Powder of Tragacanth, 10 grs.; Water, 1 oz.

26. Subnitrate of Bismuth, 10 grs.; Carbonate of Maguesium, 15 grs.; Dilute Hydrocyanic Acid, 4 mins.; Peppermint Water, 1 oz.

III.—ANTHELMINTICS.

27. Cusso, 240 grs.; Mellis Depurati, sufficient to make an electuary. "Half of this electuary to be taken early in the morning, and the remainder six hours afterwards."

28. The officinal Infusum Cusso may also be taken in the same way, in doses of 4—8 fl. oz.

29. Santonini, 2—6 grs.; Sacchari Lactis, 15 grs. To be taken early in the morning, suspended in a tablespoonful of cream. The patient ought to have fasted for twelve hours previously. The dose may be repeated daily for four or five days if necessary; and its exhibition should be followed at the end of six hours by the administration of an ounce of the compound decoction of aloes.

30. Extracti Filicis Liquidi, 20—40 mins.; Syrupi Zingiberis, 2 fl. drs.; Mucilaginis Tragacanthæ, 2 fl. oz.; Aquæ ad 4 fl. oz. To be taken early in the morning, only liquid nourishment having been allowed the previous day. Four hours afterwards a purgative dose of castor oil or compound decoction of aloes should be administered.

IV.—ANTISEPTICS.

31. Glycerine of Carbolic Acid, 8—12 mins.; Syrup of Orange Peel, 30 mins.; Cinnamon Water to 1 oz. To be taken every three hours.

32. Subnitrate of Bismuth, 10 grs.; Powdered Wood Charcoal, 10 grs.; Bicarbonate of Sodium, 5 grs. For a dose.

33. Sulphite of Sodium, 30—40 grs.; Infusion of Quassia, 1½ oz.

34. Carbonate of Bismuth, 10 grs.; Bicarbonate of Sodium, 15 grs.; Glycerine of Carbolic Acid, 10 mins.; Chloroform Water, ½ oz.; Water to 1 oz.

35. Salicylate of Sodium, 15 grs.; Peppermint Water, 1 oz.

36. Salicylate of Sodium, 15 grs.; Citrate of Potassium, 15 grs.; Peppermint Water, 1 oz.

37. Tincture of Perchloride of Iron, 40 mins.; Chlorate of Potassium, 4 grs.; Glycerine, 30 mins.; Water 1 oz. In diphtheria every hour, the medicine being used as a gargle before swallowing it.

38. Chlorate of Potassium, 2 drs.; Tincture of Perchloride of Iron, 2 drs.; Syrup to 4 oz. 30 mins. every hour for a child three years old, and 60 mins. for a child of six years old.

V.—ANTISPASMODICS.

39. Spirit of Ether, 30 mins.; Liquor Morphiæ, 15 mins.; Peppermint Water, 1 oz.

40. Spirit of Ether, 15 mins.; Comp. Tincture of Cardamoms, 30 mins.; Syrup of Ginger, 30 mins.; Camphor Mixture, 1 dr.; Peppermint Water to 1 oz.

41. Ammoniated Tincture of Valerian, 30 mins.; Spirit of Peppermint, 30 mins.; Tincture of Ginger, 15 mins.; Water, 1 oz.

42. Tincture of Assafœtida, 30 mins.; Tincture of Valerian, 1 dr.; Carbonate of Ammonium, 4 grs.; Mucilage of Tragacanth, ½ oz.; Water to 1 oz.

43. Valerianate of Iron, 2 grs.; Comp. Assafœtida Pill, 2½ grs. (pills to be silvered).

44. Valerianate of Zinc, ½—1½ grs.; Sulphate of Quinine, ½ gr.; Comp. Rhubarb Pill, 1 gr.; Extract of Gentian, 2 grs. (pills to be silvered).

VI.—ASTRINGENTS.

45. Gallic Acid, 10 grs.; Diluted Sulphuric Acid, 10 mins.; Tincture of Opium, 5 mins.; Distilled Water to 1 oz.

46. Gallic Acid, 10 grs.; Liquid Extract of Ergot, 40 mins.; Cassia Water to 1 oz.

47. Aromatic Sulphuric Acid, 15 mins.; Spirit of Chloroform, 20 mins.; Comp. Tincture of Camphor, 60 mins.; Decoction of Logwood to 1 oz.

48. Dilute Sulphuric Acid, 10 mins.; Syrup, 60 mins.; Acid Infusion of Roses, 1 oz.

49. Sulphate of Magnesium, 1½ drs.; Tincture of Digitalis, 7 mins.; Acid Infusion of Roses, 1 oz.

50. Alum, 10 grs.; Syrup of Red Poppy, ½ dr.; Acid Infusion of Roses, 1 oz.

51. Tincture of Catechu, 1 dr.; Tincture of Opium, 3 mins.; Decoction of Logwood to 1 oz.

52. Nitrate of Silver, ¼ gr.; Extract of Opium, ½ gr.; Extract of Gentian, q.s.

53. Bicarbonate of Potassium, 10 grs.; Tincture of Henbane, 15 mins.; Infusion of Buchu, 1½ oz.

54. Sulphate of Copper, ½ gr.; Opium, ¼ gr.; Extract of Gentian, 2 grs.; Flour, 2 grs.

55. Sulphate of Copper, ¼ gr.; Opium, ⅒ gr.; Confection of Roses, q. s.

56. Liquid Extract of Ergot, 15 mins.; Tincture of Perchloride of Iron, 15 mins.; Spirit of Chloroform, 15 mins.; Water to 1 oz.

57. Tincture of Hamamelis, 2—5 mins; Water to 1 oz.

58. Hazeline, 1—3 drs. for a dose.

59. Decoction of Logwood, 1 oz.; Lime Water, 2½ drs.

60. Acetate of Lead, 2 grs.; Opium, ¼ gr.; Extract of Henbane, 2 grs.

61. Acetate of Lead, 2 grs.; Dilute Acetic Acid, 30 mins.; Water, 1½ oz.

62. Oil of Turpentine, 10—20 mins.; Almond Emulsion, 1 oz.

63. Oil of Turpentine, 10 mins.; Mucilage, 1 dr.; Cinnamon Water to 1 oz.

64. Oxide of Zinc, 2½ grs.; Extract of Henbane, 2 grs.

VII.—CARDIAC SEDATIVES.

65. Solution of Tartar Emetic, 30 mins.; Solution of Acetate of Ammonium, 2 drs.; Camphor Water, 1 oz.

66. Antim. Tartarati, 1/12 gr.; Magnes. Sulph., 1 dr.; Potass. Nitrat., 5 grs.; Aquæ, 1 oz.

67. Antimonial Wine, 30 mins.; Sulphate of Magnesium, 60 grs.; Water to 1 oz.

68. Tincture of Aconite, 5 mins.; Water, 1 oz. To be repeated with caution.

69. Dilute Hydrocyanic Acid, 4 mins.; Bicarbonate of Sodium, 15 grs.; Water to 1 oz.

VIII.—CARDIAC STIMULANTS.

70. Carbonate of Ammonium, 3½ grs.; Comp. Tincture of Lavender, 20 mins.; Peppermint Water to 1 oz.

71. Carbonate of Ammonium, 4 grs.; Decoction of Bark, 1 oz.

72. Spirit of Ether, 20 mins.; Aromatic Spirit of Ammonia, 20 mins.; Camphor Water to 1 oz.

73. Aromatic Spirit of Ammonia, 20 mins.; Spirit of Chloroform, 20 mins.; Water, 1 oz.

74. Carbonate of Ammonium, 5 grs.; Spirit of Chloroform, 15 mins.; Tincture of Squill, 10 mins.; Infusion of Senega to 1 oz.

75. Carbonate of Ammonium, 5 grs.; Infusion of Serpentary, 1 oz.

76. Aromatic Spirit of Ammonia, 30 mins.; Spirit of Ether, 20 mins.; Comp. Tincture of Lavender, 30 mins.; Water to 1 oz.

IX.—CARDIAC TONICS.

77. Tincture of Digitalis, 10 mins.; Tincture of Perchloride of Iron, 10 mins.; Spirit of Juniper, 30 mins.; Chloroform Water, ½ oz.; Water to 1 oz.

78. Sulphate of Quinine, 1 gr.; Dil. Sulphuric Acid, 5 mins.; Tincture of Digitalis, 10 mins.; Water, 1 oz.

79. Liquor Strychniæ, 5 mins.; Tincture of Digitalis, 10 mins.; Infusion of Chiretta, 1 oz.

80. Tincture of Convallaria, 10 mins.; Spirit of Chloroform, 15 mins.; Water, 1 oz.

81. Tincture of Strophanthus, 5 mins.; Water, 1 oz.

82. Citrate of Caffein, 5 grs.; Tincture of Digitalis, 10 mins.; Spirit of Chloroform, 10 mins.; Water, 1 oz.

83. Powdered Digitalis, ½—1 gr.; Sulphate of Iron, 1 gr.; Powdered Capsicum, ¼ gr.; Extract of Gentian, 2 grs.

X.—DIAPHORETICS.

84. Bicarbonate of Sodium, 20 grs.; Aromatic Spirit of Ammonia, 30 mins.; Syrup of Orange, 30 mins.; Water to 1 oz.

Tartaric Acid, 15 grs.; Water to 1 oz.

To be added together, and taken when effervescing.

85. Solution of Acetate of Ammonium, 2 drs.; Spirit of Nitrous Ether, 30 mins.; Camphor Mixture, 1 oz.

86. Ammoniæ Carbonatis, 120 grs.; Acidi Hydrocyanici Diluti, 20 mins.; Tincturæ Cardamomi Compositæ, 6 fl. drs.; Infusi Aurantii ad 8 fl. oz. One sixth part to be made into an effervescing draught with one tablespoonful of fresh lemon juice, or with eighteen grains of citric acid.

87. Ipecacuanha Wine, 15 mins.; Spirit of Nitrous Ether, 30 mins.; Solution of Acetate of Ammonium, 2 drs.; Water, 1 oz.

88. Solution of Acetate of Ammonium, 1½ drs.; Antimonial Wine, 10 mins.; Camphor Mixture, 1 oz.

89. Bicarbonate of Sodium, 20 grs.; Dilute Hydrocyanic Acid, 4 mins.; Syrup of Orange, 30 mins.; Water, 1 oz.

Tartaric Acid, 15 grs.; Water, 1 oz.

To be added together, and taken when effervescing.

XI.—DIURETICS.

90. Acetate of Potassium, 20 grs.; Tincture of Digitalis, 10 mins.; Vinegar of Squills, 20 mins.; Decoction of Broom, 1 oz.

91. Infusion of Digitalis, 2 drs.; Spirit of Nitrous Ether, 30 mins.; Succ. Scoparii, 1 dr.; Peppermint Water to 1 oz.

92. Acetate of Potassium, 30 grs.; Tincture of Digitalis, 10 mins.; Tincture of Squill, 20 mins.; Sweet Spirit of Nitre, 30 mins.; Water, 1 oz.

93. Nitrate of Potassium, 6 grs.; Bicarbonate of Potassium, 10 grs.; Carbonate of Ammonium, 3 grs.; Spirit of Juniper, 1 dr.; Water, 1 oz.

94. Spirit of Juniper, 30 mins.; Acid Tartrate of Potassium, ½ dr.; Decoction of Broom, 2 oz.

95. Acetate of Potassium, 20 grs.; Spirit of Nitrous Ether, 30 mins.; Tincture of Convallaria, 10 mins.; Water, 1 oz.

96. Citrate of Caffein, 5 grs.; Tincture of Digitalis, 10 mins.; Chloroform Water, ½ oz.; Water to 1 oz.

97. Potassii Iodidi, 12 grs.; Potassii Nitratis, 30 grs.; Sp. Æther. Nitr., 1 fl. dr.; Tinct. Scillæ, 30 mins.; Tinct. Digitalis, 24 mins.; Aquæ ad 4 oz.; Syrupi Aurantii, 4 oz. A tablespoonful every four hours. (For a child six years old.)

98. Resin of Copaiba, 15 grs.; Comp. Powder of Almonds, 30 grs.; Water, 1 oz.

99. Squill, 1 gr.; Blue Pill, 2 grs.; Digitalis Powder, ½ gr.; Extract of Conium, 1½ grs.; Creosote, q. s. To make one pill.

100. Digitalis Foliæ, Hydrargyri Subchloridi, of each 5 grs.; Extracti Conii, 60 grs. Divide into fifteen pills; one to be taken three times a day.

101. Copaibæ, 1 oz.; Vitel. Ovi, No. 2; Syr. Tolu, 2 oz.; Vini Albi, 4 oz. One tablespoonful for a dose.

XII.—EXCITO-MOTORS.

102. Liquor Strychniæ, 5 mins.; Dilute Hydrochloric Acid, 10 mins.; Infusion of Chiretta, 1 oz.

103. Tincture of Nux Vomica, 10 mins.; Comp. Infusion of Gentian, 1 oz.

104. Ferri et Ammon. Cit., 5 grs.; Potass. Iodidi, 2 grs.; Liq. Strychniæ, 5 mins.; Aquæ, 1 oz.

105. Liquor Strychniæ, 5 mins.; Dilute Nitro-hydrochloric Acid, 10 mins.; Liquor Ferri Perchloridi, 10 mins.; Water to 1 oz.

106. Sulphate of Quinine, 1½ grs.; Sulphate of Iron, 1½ grs.; Liquor Strychniæ, 4 mins.; Aromatic Sulphuric Acid, 10 mins.; Infusion of Quassia to 1 oz.

XIII.—DEPRESSO-MOTORS.

107. Potassii Bromid., 15 grs.; Tinct. Valer. Ammon., ½ dr.; Tinct. Camph. Co., 20 mins.; Aquæ ad 1 oz.

108. Chloral Hydrate, 10—15 grs.; Tinct. Cardam. Co., ½ dr.; Syrupi, 2 drs.; Inf. Caryophylli ad 1½ oz.

109. Bromide of Potassium, 10 grs.; Chloral Hydrate, 10 grs.; Syrup of Orange, 30 mins.; Water, 1 oz.

110. Bromide of Potassium, 1 dr.; Bicarbonate of Potassium, 12 grs.; Spirit of Chloroform, 40 mins.; Syrup of Poppy, 2 drs; Water to 3 oz. A dessertspoonful every six hours for a child of two years.

111. Spirit of Ether, 30 mins.; Ethereal Tincture of Lobelia, 15 mins.; Camphor Mixture, 1 oz.

112. Ethereal Tincture of Lobelia, 15 mins.; Carbonate of Ammonium, 5 grs.; Spirit of Chloroform, 8 mins.; Syrup of Squill, 30 mins.; Infusion of Senega, 1 oz.

113. Ethereal Tincture of Lobelia, 20 mins.; Ipecacuanha Wine, 20 mins.; Ammoniacum Mixture, 1 oz.

114. Liq. Potassæ, 12 mins.; Bromide of Potassium, 12 mins.; Tincture of Calumba, 10 mins.; Chloroform Water, ½ oz.; Water to 1 oz.

XIV.—EXPECTORANTS.

115. Potassii Bicarbonatis, 40 grs.; Acid. Citrici, 20 grs.; Vin. Antimoniale, 1½ drs.; Vin. Ipecac., 20 mins.; Syr. Limonum, 2½ drs.; Aquæ, 2½ oz. A dessertspoonful every three or four hours (for a child two years old).

116. Solution of Acetate of Ammonium, 2 drs.; Ipecac. Wine, 20 mins.; Water to 1 oz.

117. Ipecacuanha, ⅓ gr.; Squill, ⅓ gr.; Extract of Conium, 1⅔ grs.; Extract of Henbane, 1⅔ grs. In one pill.

118. Powdered Squill, 2 grs.; Morphia, ⅛ gr.; Ipecacuanha, ½ gr.; Oil of Aniseed, 1 drop. In one pill.

119. Chloride of Ammonium, 10 grs.; Spirit of Chloroform, 20 mins.; Antimonial Wine, 10 mins.; Camphor Water, 1 oz.

120. Antimonial Wine, 10 mins.; Tincture of Squill, 10 mins.; Infusion of Linseed, 1 oz.

121. Tincture of Squill, 10 mins.; Comp. Tincture of Camphor, 15 mins.; Infusion of Cascarilla, 1 oz.

122. Ammon. Carb., 4 grs.; Sp. Chloroform., 15 mins.; Decoct. Senegæ, 1 oz.

123. Decocti Senegæ, 2 oz. 5 drs.; Ammon. Carb., 5 grs.; Tinct. Scillæ, 16 mins.; Syr. Tolu, 2 drs. Two teaspoonfuls in milk every fourth hour (for a child from three to four years old).

124. Antimonial Wine, 20 mins.; Solution of Acetate of Ammonium, 1 dr.; Syrup of Tolu, 1 dr.; Water, 1 oz.

125. Comp. Tincture of Camphor, 30 mins.; Tincture of Squill, 15 mins.; Syrup of Tolu, 1 dr.; Ammoniacum Mixture, ½ oz.; Water to 1 oz.

126. Vinegar of Squill, 20 mins.; Comp. Tincture of Camphor, 30 mins. Infusion of Cascarilla, 1 oz.

127. Carbonate of Ammonium, 5 grs.; Spirit of Ether, 20 mins.; Tincture of Squill, 20 mins.; Tincture of Digitalis, 10 mins.; Infusion of Senega, 1 oz.

128. Compound Powder of Ipecac., 2 grs.; Extract of Henbane, 2 grs. For one pill.

129. Hydrochlorate of Morphia, $\frac{1}{8}$ gr.; Powdered Ipecacuanha, 1 gr.; Powdered Squill, 1 gr.; Extract of Henbane, 2 grs.

130. Guaiacum, 1 gr.; Ipecacuanha, $\frac{1}{2}$ gr.; Opium, $\frac{1}{2}$ gr.; Comp. Squill Pill, 2 grs.

131. Ipecacuanha, $\frac{1}{2}$ gr.; Extract of Conium, 2 grs.; Powder of Squill, $1\frac{1}{2}$ grs.; Tartar Emetic, $\frac{1}{24}$ gr.

XV.—PURGATIVES.

Laxatives.

132. Powdered Guaiacum, 40 grs.; Syrup of Ginger, $\frac{1}{2}$ oz.; Confection of Senna, 2 oz. Dose, one teaspoonful.

133. Guaiacum, 1 dr.; Carbonate of Magnesia, 1 dr.; Sulphur, $1\frac{1}{2}$ drs.; Ginger, $\frac{1}{2}$ dr.; Treacle, $2\frac{1}{2}$ drs. Dose, 1 to 3 drs.

134. Confection of Senna, 6 drs.; Sulphur, 1 dr. Dose, 1 to 2 drs.

135. Senna, 2 oz.; Sulphur, 2 oz.; Acid Tartrate of Potash, 4 oz.; Honey, q. s. Dose, 1 to 2 drs.

136. Confection of Senna, 1 oz.; Sulphur, 2 drs.; Sulphate of Potassium, 2 drs.; Syrup, q. s. Dose, 50 to 100 grs.

137. Confectionis Piperis, Syrupi Sennæ, Confectionis Sulphuris, of each 1 oz.; Pulveris Jalapæ, 30 grs. One teaspoonful every morning.

138. Confectionis Sulphuris, 2 oz.; Extracti Taraxaci, 1 oz. One teaspoonful daily before breakfast.

139. Sulphate of Potassium, $\frac{1}{2}$ oz.; Syrup of Ginger, $\frac{1}{2}$ oz.; Confection of Senna, 1 oz. One teaspoonful each night.

Simple Purgatives.

140. Carbonate of Magnesium, 15 grs.; Powdered Rhubarb, 8 grs.; Ipecacuanha Wine, 15 mins.; Peppermint Water, 1 oz.

141. Pulveris Rhei, Sodii Bicarbonatis, of each 20 grs.; Infusi Rhei, 1 fl. oz. To be taken early in the morning, with two or three tablespoonfuls of water, twice or thrice a week.

142. Tincture of Gentian, $\frac{1}{2}$ dr.; Bicarbonate of Sodium, 10 grs.; Spirit of Chloroform, 10 mins.; Infusion of Rhubarb, $\frac{1}{2}$ oz.; Peppermint Water to 1 oz.

143. Liquid Extract of Cascara, 25 mins.; Maltine, 1 oz. To be taken each day before luncheon.

144. Infusion of Senna, $\frac{1}{2}$ oz.; Tincture of Ginger, 20 mins.; Comp. Infusion of Gentian to $1\frac{1}{2}$ oz.

145. Tartarated Soda, 80 grs.; Tartrate of Potassium, 80 grs.; Tincture of Senna, 80 mins.; Water to 1 oz.

146. Dilute Sulphuric Acid, 10 mins.; Sulphate of Magnesium, 1 dr.; Syrup of Red Poppy, ½ dr.; Mint Water to 1 oz.

147. Light Carbonate of Magnesium, 15 grs.; Sulphate of Magnesium, 1 dr.; Powdered Rhubarb, 20 grs.; Peppermint Water to 1½ oz.

148. Magnes. Sulph., 2 drs.; Magnes. Carb., 1 scruple; Syr. Zingib., 1 dr.; Aquæ Anethi, 11 drs.

149. Light Carbonate of Magnesium, 5 grs.; Sulphate of Magnesium, 1 dr.; Peppermint Water to 1½ oz.

150. Sulphate of Sodium, 45 grs.; Dil. Sulphuric Acid, 15 mins.; Peppermint Water, ½ oz.; Water to 1 oz.

151. Sulphate of Sodium, 90 grs.; Sulphate of Quinine, 2 grs.; Dilute Sulphuric Acid, 6 mins.; Syrup of Orange, 30 mins.; Peppermint Water, 1½ oz.

152. Confectionis Sennæ, 2 oz.; Confectionis Scammonii, Syrupi Zingiberis, of each 1 oz.; Ferri Carbonatis Saccharatæ, 220 grs. One teaspoonful early every morning.

153. Confectionis Sennæ, Potassæ Tartratis Acidæ, Extracti Taraxaci, of each 1 oz. One teaspoonful to be taken occasionally, an hour before breakfast.

154. Powdered Senna, 2 drs.; Comp. Powder of Jalap, 3 drs.; Syrup of Ginger, 6 drs. Half a teaspoonful for a dose.

155. Extracti Nucis Vomicæ, 2 grs.; Extracti Aloës Barbadensis, 6 grs.; Extracti Rhei, 20 grs. Mix and divide into six pills. One to be taken each day at dinner.

156. Pepsinæ Porci, 32 grs.; Extracti Aloës Barbadensis, 4—8 grs.; Glycerini, sufficient to make a mass. Divide into eight pills. One to be taken each day.

157. Extracti Nucis Vomicæ, 3 grs.; Pulveris Ipecacuanhæ, 6 grs.; Pilulæ Rhei Compositæ, *vel* Pilulæ Aloës et Assafœtidæ, 40 grs. Divide into twelve pills. Two to be taken every alternate night at bedtime.

158. Sulphate of Iron, 1 gr.; Aloes, ½ gr.; Extract of Gentian, q. s.

159. Blue Pill, 2½ grs.; Compound Rhubarb Pill, 2½ grs.

160. Blue Pill, 2 grs.; Compound Extract of Colocynth, 3 grs.

Drastic Purgatives.

161. Calomel, 1½ grs.; Comp. Colocynth Pill, 3 grs.; Capsicum, $\frac{1}{0}$ gr.

162. Resin of Podophyllin, ⅛—¼ gr.; Creosote, ½ min.; Comp. Extract of Colocynth, 1½ gr.; Comp. Rhubarb Pill, 1½ grs.; Extract of Henbane, 1½ grs.

163. Resin of Podophyllin, ¼ gr.; Comp. Rhubarb Pill, 2½ grs.; Extract of Henbane, 1 gr.

164. Extracti Hyoscyami, 40 grs.; Pilulæ Colocynthidis Compositæ, *vel* Jalapæ Resinæ, 20 grs.; Extracti Nucis Vomicæ, 3 grs. Divide into twelve pills. One to be taken every night.

165. Hydrarg. Subchlor., 12 grs.; Ext. Colocynth. Co., ½ dr.; Ol. Caryophylli, 8 mins. To be divided into eight pills. One or two for a dose.

166. Pil. Coloc. Co., 2 scruples; Ext. Hyoscyami, 1 scruple. To be divided into twelve pills.

Hydragogue Purgatives.

167. Gamboge, 3 grs.; Acid Tartrate of Potassium, 30 grs.

168. Gamboge, 3 grs.; Comp. Powder of Jalap, 30 grs.

169. Elaterii, 1 gr.; Ext. Gentianæ, 1 scruple. To be divided into eight pills. One or two for a dose.

170. Liquoris Ammoniæ Acetatis, 9 fl. drs.; Spiritûs Ætheris Nitrosi, 4 fl. drs.; Elaterii, 1 gr.; Syrupi Zingiberis, 3 fl. drs. Two small teaspoonfuls in a wine-glassful of water every two hours, until the bowels are freely acted on.

171. Extract of Elaterium, 4 grs.; Acid Tartrate of Potash, 100 grs.; Ginger, 20 grs. Dose, 5 to 30 grs.

172. Elaterium, $\frac{1}{12}$ gr.; Extract of Henbane, 4 grs.

173. Compound Powder of Jalap, 20—60 grs. To be taken each morning early.

XVI.—SEDATIVES.

174. Spirit of Ether, 20 mins.; Solution of Hydrochlorate of Morphia, 10—20 mins.; Sal Volatile, 20 mins.; Camphor Julep to 1 oz.

175. Liq. Morphiæ Hydroch., 10—25 mins.; Sp. Ætheris, ½ dr.; Tinct. Lobeliæ, 15 mins.; Aquæ Camph., 1 oz.

176. Sodii Bicarbonatis, 15 grs.; Liquoris Morphiæ Hydrochloratis, 10 mins.; Acidi Hydrocyanici Diluti, 3 mins.; Aquæ Cinnamomi, 1 fl. oz.

177. Potass. Bromid., ½ dr.; Tinct. Cannabis Indicæ, 10 mins.; Mucilag. Acaciæ, 2 drs.; Aquæ Cinnam. ad 1 oz.

178. Syrupi Scillæ, Syrupi Rhœados, of each 10 fl. drs.; Aquæ Laurocerasi, 15 mins.; Tincturæ Benzoini Compositæ, 3 fl. drs.; Liquoris Morphiæ Hydrochloratis, 1 fl. dr. A small teaspoonful to be taken frequently when the cough is troublesome.

179. Spiritûs Chloroformi, 4 fl. drs.; Vini Ipecacuanhæ, 2 fl. drs.; Liquoris Morphiæ Hydrochloratis, 1 fl. dr.; Acidi Hydrocyanici Diluti, 15 mins.; Syrupi Mori ad 3 fl. oz. One teaspoonful every two or three hours, until the cough is relieved.

180. Oxymel of Squill, 2 drs.; Dilute Sulphuric Acid, 30 mins.; Tincture of Opium, 15 mins.; Treacle, 6 drs. One teaspoonful when the cough is troublesome.

181. Olive Oil, 4 drs.; Confection of Hips, 6 drs.; Vinegar of Squills 1½ drs.; Tincture of Opium, 7½ mins.; Treacle, 3 drs. One to two teaspoonfuls when the cough is troublesome.

182. Oxymel of Squill, 160 mins.; Comp. Tincture of Camphor, 80 mins.;

Ipecacuanha Wine, 40 mins.; Mucilage to 1 oz. One teaspoonful when the cough is troublesome.

183. Hydrochlorate of Morphia, $\frac{1}{16}$ gr.; Laurel Water, 8 mins.; Spirit of Chloroform, 4 mins.; Syrup of Lemons, 30 mins.; Glycerine to 1 dr. Dose, 1 dr.

184. Tincture of Gelsemium, 10 mins.; Infusion of Cascarilla, 1 oz.

185. Extract of Henbane, 2 grs.; Dover's Powder, 2 grs. In one pill.

186. Tincture of Belladonna, 10 mins.; Camphor Water to 1 oz.

187. Spiritûs Ætheris, 90 mins.; Spiritûs Ammoniæ Aromatici, 2 fl. drs.; Tincturæ Belladonnæ, 30 mins.; Tincturæ Chloroformi Compositæ, 40 mins.; Aquæ Camphoræ ad 4 fl. oz. Two tablespoonfuls for a dose.

188. Tinct. Belladonnæ, 10 mins.; Tinct. Nucis Vom., 10 mins.; Aquæ Camph., 1 oz.

189. Mist. Amygdalæ, 1½ oz.; Potass. Nitrat., 5 grs.; Tinct. Camph. Co., 1 dr.; Tinct. Hyoscyami, ½ dr. To be taken at bedtime.

190. Tinct. Hyoscyami, ½ dr.; Sp. Chloroformi, 20 mins.; Aquæ Camphoræ, 1 oz. To be repeated in three hours if necessary.

191. Liniment. Aconiti, 1 oz.; Liniment. Saponis, 1 oz. One or two teaspoonfuls to be rubbed on the painful part.

192. Tinct. Opii, 2 drs.; Chloroform, 2 drs.; Liniment. Saponis, 1½ oz. One or two teaspoonfuls to be rubbed on the painful part.

193. Atropinæ, 1 gr.; Morphiæ Hydrochlorat., 8 grs.; Spirit and Water, 1 oz. A small piece of lint to be dipped in this solution, covered with oil-silk, and placed on the part.

194. Liniment. Belladonnæ, 1 oz.; Liniment. Saponis, 1 oz. A small quantity to be rubbed on the painful part.

195. Liniment. Belladonnæ, 7 drs.; Chloroformi Belladonnæ, 1 dr. To be sprinkled on impermeable piline, and firmly pressed on the affected part for five minutes.

196. Extract of Belladonna, ½ oz.; Water, 1 dr.; Glycerine to 1 oz. To be used as a liniment.

XVII.—TONICS.

Acting on the Blood.

197. Dilute Phosphoric Acid, 10 mins.; Tincture of Perchloride of Iron, 15 mins.; Spirit of Chloroform, 15 mins.; Infusion of Quassia, 1 oz.

198. Citrate of Iron and Ammonium, 5 grs.; Citric Acid, 10 grs.; Water, 1 oz. To be taken with 10 grs. of Bicarbonate of Sodium in a state of effervescence.

199. Citrate of Iron and Quinine, 5 grs.; Tincture of Orange, 20 mins.; Water, 1 oz.

200. Tincture of Perchloride of Iron, 10 mins.; Glycerine, 30 mins.; Compound Tincture of Cardamom, 30 mins.; Water, 1 oz.

201. Ammonio-citrate of Iron, 5 grs.; Aromatic Spirit of Ammonia, 30 mins.; Glycerine, 60 mins.; Infusion of Calumba, 1 oz.

202. Syrup of Phosphate of Iron, 60 mins.; Syrup of Hypophosphite of Sodium, 60 mins.; Water, 1 oz.

203. Sulphate of Iron, 1 gr.; Extract of Aloes, 1 gr.; Extract of Gentian, 2 grs. For one pill.

204. Pepsin, 2 grs.; Reduced Iron, 2 grs.; Glycerine, q. s.

205. Tincture of the Acetate of Iron, 10 mins.; Dilute Acetic Acid, 30 mins.; Solution of Acetate of Ammonium, 2 drs.; Water to 1 oz.

Acting on the Digestive Organs.

206. Bicarbonate of Sodium, 15 grs.; Dilute Hydrocyanic Acid, 3 mins.; Compound Infusion of Gentian, 1 oz.

207. Aromatic Spirit of Ammonia, 20 mins.; Spirit of Chloroform, 20 mins.; Compound Infusion of Orange, 1 oz.

208. Infusion of Gentian, 6 drs.; Infusion of Senna, 3 drs.; Compound Tincture of Cardamoms, 1 dr.

209. Dilute Nitric Acid, 10 mins.; Comp. Tincture of Cardamoms, 1 dr.; Water, 1 oz.

210. Dilute Nitro-hydrochloric Acid, 10 mins.; Infusion of Chiretta, 1 oz.

211. Dilute Phosphoric Acid, 10 mins.; Tincture of Nux Vomica, 5 mins.; Spirit of Chloroform, 10 mins.; Syrup of Orange, 30 mins.; Compound Infusion of Orange, 1 oz.

212. Salicine, 5 grs.; Dilute Sulphuric Acid, 10 mins.; Tincture of Orange, 30 mins.; Comp. Infusion of Orange, 1 oz.

213. Rhubarb, in powder, 5 grs.; Bicarbonate of Sodium, 10 grs.; Aromatic Spirit of Ammonia, 30 mins.; Infusion of Calumba, 1 oz.

214. Bicarbonate of Sodium, 10 grs.; Aromatic Spirit of Ammonia, 30 mins.; Infusion of Rhubarb, 4 drs.; Compound Infusion of Gentian, 4 drs.

215. Sulphate of Quinine, 1 gr.; Dilute Sulphuric Acid, 2 mins.; Comp. Tincture of Cardamoms, 30 mins.; Water, 1 oz.

216. Sulphate of Quinine, 2 grs.; Carbonate of Ammonium, 4 grs.; Bicarbonate of Potassium, 20 grs.; Chloroform Water, 2 drs.; Water to 1 oz.

217. Sulphate of Quinine, 1 gr.; Dilute Sulphuric Acid, 5 mins.; Sulphate of Magnesium, 60 grs.; Water, 1 oz.

218. Dilute Sulphuric Acid, 10 mins.; Decoction of Yellow Bark, 1 oz.

219. Carbonate of Ammonium, 5 grs.; Decoction of Bark, 1 oz.

220. Comp. Tincture of Cinchona, 1 dr.; Dilute Phosphoric Acid, 10 mins.; Syrup of Orange, 40 mins.; Comp. Infusion of Orange, 1 oz.

221. Bicarbonate of Sodium, 10 grs.; Sp. Chloroform, 10 mins.; Comp. Tincture of Gentian, 30 mins.; Infusion of Rhubarb, ½ oz.; Peppermint Water, 1 oz.

Nervine Tonics.

222. Nitrate of Silver, ½ gr.; Powdered Liquorice Root, 2 grs.; Extract of Gentian, 2 grs.

223. Oxide of Silver, ½ gr.; Powdered Ginger, ½ gr.; Powdered Liquorice Root, 2 grs.; Treacle, a sufficiency.

224. Solution of Arsenic, 5 mins.; Infusion of Quassia, 1 oz.

225. Arsenical Solution, 4 mins.; Cinnamon Water, 1 oz.

226. Liquoris Strychniæ, 5 mins.; Dilute Hydrochloric Acid, 10 mins.; Infusion of Chiretta, 1 oz.

227. Liquoris Strychniæ, 5 mins.; Dilute Nitro-hydrochloric Acid, 10 mins.; Tincture of Perchloride of Iron, 10 mins.; Chloroform Water, ½ oz.; Water to 1 oz.

228. "Easton's Syrup" contains 1 gr. Phosphate of Iron, 1 gr. Phosphate of Quinine, $\frac{1}{32}$ gr .of Phosphate of Strychnia, in each fluid drachm. Dose, 1 dr. twice or thrice a day.

229. Hypophosphite of Lime, 5 grs.; Hypophosphite of Sodium, 5 grs.; Glycerine, 15 mins.; Distilled Water, 1 oz.

230. Phosphorus Pill, 1½ grs.; Extract of Nux Vomica, ½ gr.

231. Phosphorus Pill, 1 gr.; Reduced Iron, 3 grs.; Sulphate of Quinine, ½ gr.

232. Sulphate of Zinc, 2 grs.; Comp. Rhubarb Pill, 1 gr.; Extract of Gentian, 2 grs.

233. Valerianate of Zinc, ½ gr.; Sulphate of Quinine, ½ gr.; Comp. Rhubarb Pill, 1 gr.; Extract of Gentian, 2 grs.

234. Ammoniated Sulphate of Copper, 1 gr.; Extract of Gentian, 3 grs.

XVIII.—GARGLES.

235. Solution of Chlorinated Soda, 4 drs.; Water, 20 oz.

236. Alum, 1 dr.; Dilute Sulph. Acid, 2 drs.; Tinct. Myrrh, 4 drs. Water to 13 oz.

237. Dilute Nitric Acid, 1 dr.; Treacle, 1 dr.; Water to 4 oz.

238. Chlorate of Potassium, 1 dr.; Honey or Glycerine, ½ oz.; Water to 8 oz.

239. Borax, 1 dr.; Honey, 2 drs.; Water to 4 oz.

240. Tannic Acid, ½ dr.; Rectified Spirit, ½ dr.; Camphor Water to 8 oz.

241. Dilute Hydrochloric Acid, 1 dr.; Honey, ½ oz.; Water, 8 oz.

242. Argenti Nit., 2—5 grs.; Aquæ Destil., 1 oz. To be applied to the mouth.

243. Solution of Permanganate of Potassium, ½ oz.; Water, 20 oz.

XIX.—LOZENGES.

Throat Hospital Lozenges.

244. Benzoic Acid, ½ gr., every four hours. Valuable voice lozenge and stimulant.

245. Carbolic Acid, 1 gr., every four hours. Antiseptic and stimulant in offensive secretion and ulceration.

246. Tannic Acid, 1½ grs., every four hours. Strongly astringent—for relaxed throat.

247. Marsh-mallow, 1 gr. Pulv., every half-hour. Emollient after operation and irritable throat or cough.

248. Catechu, 2 grs., every three hours. Astringent, milder than tannin, in relaxed throat.

249. Cubebs, ½ gr., every three hours. To allay excessive secretion.

250. Guaiacum, 2 grs., every two hours. For inflamed throat.

251. Logwood, 2 grs. Ext., every three hours. Mild astringent for relaxed throat.

252. Kino, 2 grs. Pulv., every three hours. Astringent, milder than rhatany, in relaxed throat.

253. Rhatany, 3 grs. Ext., every three hours. Most useful astringent in relaxed throat; does not constipate.

254. Lettuce, 1 gr. Ext., every hour. Soothing mild sedative to allay irritation and cough.

255. Chlorate of Potassium, 3 grs., every three hours. Antiseptic and stimulant for sore throat and ulceration.

256. Citrate of Potassium, 3 grs., every three hours. Topical sialogogue to increase secretion.

257. Acid. Tart. Potash, 3 grs., every three hours. Topical sialogogue to increase secretion.

258. Pellitory, 1 gr. Pulv., every three hours. Valuable sialogogue to increase secretion.

259. Opium, $\frac{1}{10}$ gr. Ext., every three hours. Sedative for irritable cough and painful states of the throat.

British Pharmacopœia Lozenges.

260. Tannic Acid, ½ gr., every three hours. Astringent in relaxed throat.

261. Bismuth, 2 grs., every three hours. Indigestion, heartburn, and irritable stomach.

262. Catechu, 1 gr., every three hours. Astringent in relaxed throat.

263. Reduced Iron, 1 gr., every three hours. Mild tonic.

264. Ipecacuanha, ¼ gr., every three hours. To promote expectoration.

265. Morphia, $\frac{1}{30}$ gr., every three hours. Sedative for irritable cough.

266. Morphia, $\frac{1}{30}$ gr., and Ipecacuanha, $\frac{1}{12}$ gr., every three hours. Cough lozenge, sedative and expectorant.

267. Opium, $\frac{1}{10}$ gr., every three hours. Sedative for irritable cough.

268. Chlorate of Potassium, 5 grs., every three hours. Antiseptic and stimulant for sore throat and ulceration.

269. Bicarbonate of Sodium, 5 grs., every three hours. Antacid for acidity and heartburn.

XX.—APPLICATIONS FOR THE THROAT.

270. Sir Morell Mackenzie gives the following solutions as being most

valuable in chronic laryngitis for application with a brush:—Ferri Perchlor., 60 grs.; Ferri Persulph., 60 grs.; Ferri Sulph., 120 grs.; Cupri Sulph., 10 grs.; Zinc. Chlorid., 30 grs.; Zinc. Acet., 5 grs.; Zinc. Sulph., 10 grs.; Alum, 30 grs.; Alum Chlor., 60 grs. Dissolved in an ounce of water or glycerine.

271. For inhalations Sir Morell Mackenzie advises—Ol. Pini Sylvestris, 2 fl. drs. ad 3 fl. drs.; Magnes. Carb. Levis, 60 to 90 grs.; Aquæ ad 3 fl. oz. A teaspoonful to be added to a pint of water at 150° F., and inhaled for five minutes two or three times daily. Ol. Juniperi, 20 mins.; Magnes. Carb. Levis, 10 grs.; Aquæ ad 3 fl. oz. A teaspoonful for each inhalation, as above.

XXI.—SPRAY INHALATIONS.

These, according to the Pharmacopœia of the Throat Hospital, may consist of the following ingredients to 1 oz. of water:

272. Carbolic Acid, 3 grs.; Tannic Acid, 5 grs.; Alum, 8 grs.; Perchloride of Iron, 3 grs.; Chlorate of Potassium, 20 grs.; Bromide of Potassium, 20 grs.; Benzoate of Sodium, 20 grs.; Salicylate of Sodium, 20 grs.; Sulphocarbolate of Zinc, 5 grs.; Sulphate of Zinc, 5 grs.; Chloride of Sodium, 5 grs.

XXII.—FOR ORAL OR NASO-ORAL RESPIRATORS.

273. Tincture of Iodine, 2 drs.; Carbolic Acid, 2 drs.; Creosote, 1 dr.; Rectified Spirit, 1 oz.—(*Victoria Park Chest Hospital.*)

274. Ethereal Tincture of Iodine, 2 drs.; Carbolic Acid, 2 drs.; Creosote or Thymol, 1 dr.; Rectified Spirit to 1 oz.—(*Coghill.*)

275. Eucalyptol or Ol. Pini Sylvestris, 3 drs.; Rectified Spirit, 1 oz.—(*Douglas Powell.*) "10 to 15 drops of one of the above to be dropped on the wool of an oral respirator, and worn two or three times a day for half an hour to an hour."

XXIII.—ENEMATA.

276. Comp. Mixture of Senna, 4 oz.; Decoction of Barley (tepid), 8 oz.

277. Castor Oil, 2 oz.; Decoction of Barley (tepid), 8 oz.

278. Sulphate of Magnesium, 1 oz.; Olive Oil, 2 oz.; Decoction of Barley, 18 oz.

279. Castor Oil, 4 drs.; Tincture of Assafœtida, 4 drs.; Mucilage of Starch to 12 oz.

280. Tincture of Opium, 15—30 mins.; Mucilage of Starch, 2 oz.

Nutritive Enemata.

281. Warm Beef-tea, 2 fl. oz.; one Egg. Mix thoroughly. Brandy and opium to be added as required.

282. Cooked Beef, Mutton, or Chicken, 3 oz. 7 drs.; Sweetbread, 1 oz. 7 drs.; Fat, 6 drs.; Brandy, 2 drs.; Water, 3 oz. These ingredients, mixed together, will measure 9 oz. The meat, sweetbread, and fat must be first passed through a fine mincing machine, and then rubbed up with the water, gradually added, to make a thick paste. It is well to warm the mass to a temperature of 100° F. shortly before using it. The enema should be administered at a temperature of 90° to 95°, and ought not to be given more than twice in the twenty-four hours. The rectum should be washed out twice or thrice a week with tepid water three or four hours before giving the nutritive injection. Half a drachm of panereatine (Savory and Moore), or 4 oz. of panereatic emulsion may be used if the fresh panereas cannot be obtained. In the latter case the fat, brandy, and water should be omitted. —(*Throat Hospital.*)

283. Strong Beef-tea, 5 oz.; Pepsin (pig's), 10 grs.; Dilute Hydrochloric Acid, 20 mins. Digest the beef-tea, pepsin, and acid for four hours at a temperature of 100° F., and then neutralise with carbonate of sodium.—(*University College Hospital.*)

284. Strong Beef-tea, 3 oz.; one Egg; Brandy, ½ oz.; Pepsin (pig's), 12 grs.; Dilute Hydrochloric Acid, 24 mins. Digest for six hours at a temperature of 100° F., neutralise with carbonate of sodium, and add the brandy.

285. Three to five Eggs beaten up with 4 oz. of a 20 per cent. Solution of Grape-sugar forms an excellent nutritive enema.—(*Ringer.*)

286. Lean Beef, finely minced, 1 lb.; Water, 20 oz.; Liquor Panereatieus, 6 drs. Mix the beef and water, simmer gently one and a half hours; strain into a covered jug. Beat the residue into a paste and add it to the jug. When it has cooled to 140° F., add the panereatic solution, and stir well together. Put it in a warm place for two hours, then boil for three minutes and strain. Not more than 4 oz. to be injected at a time.—(*London Hospital.*)

287.—Liquor Pancreatieus is peculiarly adapted for admiuistration with nutritive enemata. The enema may be prepared in the usual way with milk-gruel and beef-tea, and a dessertspoonful of Liquor Pancreatieus should be added to it just before administration.

288. As there is no reason for believing the rectal or colonic secretions have any digestive power, it is necessary that all injections used for nourishing the patient should be thoroughly digested, and in a concentrated form; any food may be thoroughly digested with Zymine Powder and Sodium Bicarbonate. If ordinary beef-tea is injected it is usually in great part discharged again. When peptonised food is injected it should be given at the temperature of the body, thrown in slowly, and as high up the intestine as possible.

289. Meat suppositories are employed where the rectum is unable to retain enemata. They are usually composed of peptonised or panereatised materials.

XXIV.—PEPTONISED FOODS.

The following directions are those given in the Pharmacopœia of the London Hospital.

290. Peptonised Milk.—Take one pint of milk, dilute it with a quarter of a pint of water, and divide the mixture into two equal portions; heat one portion to the boiling-point, and then mix it with the cold portion in a jug provided with a cover. Add to this 3 fl. drs. of pancreatic solution * and 20 grs. of Bicarbonate of Sodium, and mix well together. Set the covered jugs aside in a warm situation for two and a half hours, and then boil the contents for three minutes.

291. Peptonised Gruel.—To one pint of well-boiled gruel, made thick and strong, and allowed to cool to 140° F., add 4 drs. of Pancreatic Solution, and mix well together; pour the mixture into a jug provided with a cover, and set aside in a warm situation for two hours; then boil the product for three minutes, and finally strain.

292. Peptonised Milk-gruel.—Gruel, while still boiling, is added to an equal quantity of cold milk, in a jug provided with a cover. To each pint of this mixture 3 drs. of Pancreatic Solution, together with 20 grs. of Bicarbonate of Sodium, are added, and the whole stirred. The covered jug is then set aside in a warm situation for two hours, the contents boiled for three minutes, and then strained.

293. Peptonised Beef-tea.—Mix ½ lb. of finely minced lean beef with a pint of water, and 20 grs. of Bicarbonate of Sodium, and simmer gently for one and a half hours. When it has cooled down to 140° F.† add 4 drs. of Pancreatic Solution, and keep the mixture in a warm situation for two hours, agitating it occasionally. Then strain without pressure, and boil the strained liquid for five minutes.

The following directions are given for the use of Fairchild's Zymine Peptonising Powder.

294. Peptonised Milk.—Add a Fairchild Zymine Peptonising Powder to 1 pint of milk (diluted with ¼ pint water). Keep warm twenty minutes, boil, sweeten, and add a little cream.

295. Peptonised Milk for an Infant.—¼ Powder to ¼ pint milk and ¼ pint water.

296. Peptonised Gruel.—Add a Zymine Peptonising Powder to ½ pint

* Benger's "Liquor Pancreaticus" is generally used.

† This temperature can be estimated with sufficient accuracy, should no suitable thermometer be at hand, by tasting. If too hot to sip without burning the mouth, it would entirely destroy the activity of the Liquor Pancreaticus, and must be allowed to cool before such addition is made.

milk and ½ pint gruel (made with water). Keep warm thirty minutes, stirring occasionally.

297. Peptonised Milk Jelly.—Pour ¾ oz. gelatine into a pint of water, and when it is swollen, gently warm, add a pint of peptonised milk (which has been boiled), ¼ lb. crushed sugar, juice of lemon or orange, three tablespoonfuls of rum, and strain through finest flannel. Put it in a cold place to set.

298. Peptonised Beef-tea.—Cook gently ½ lb. lean meat (minced) in ½ pint of water till it boils. Add ½ pint more cold water, ½ dr. Zymine, and a scruple of Soda Bicarb. Keep warm three hours, boil, strain, and season.

FOREIGN FORMULÆ.

299. Carbolic Acid, 30 grs.; Camphorated Tincture of Opium, 3 oz. 1 dr., to be put into 8 oz. of hot water in an inhaling bottle, and the steam to be inhaled for five minutes two or three times a day.

300. Liquoris Ammonii Acetatis, 2 oz.; Tincturæ Opii Camphoratæ, 2½ oz.; Vini Antimonii, ½ oz.; Tincturæ Veratri Viridis, 1½ drs. Give to an adult one teaspoonful in a tablespoonful of water every three hours.—(*Dr. Davis.*)

301. The "turpentine-pipe" consists of a flask which is filled to the height of several inches with water, and then with a layer of oil of turpentine two centimetres thick. Two glass tubes, open at both ends, are passed through the cork; one straight tube extends down into the layer of water; the lower end of the other is free in the upper part of the flask. The outer portion of this last tube is long enough to be bent at an angle, and forms the mouthpiece of the pipe, which the patient sucks.—(*Dr. Strümpell.*)

302. Ammoniated Tincture of Guaiacum, 1 oz.; Compound Tincture of Cinchona, 1 oz.; Honey, 3 oz.; Chlorate of Potassium, 400 grs.; Water, 1 pint. 1 dr. may be used as a gargle (? mixed with water) every two hours, and also 1 dr. may be taken internally every two or more hours.—(*Dr. J. Solis Cohen.*)

303. Dried Sulphate of Sodium, 44 parts; Sulphate of Potassium, 2 parts; Chloride of Sodium, 18 parts; Bicarbonate of Sodium, 36 parts (Artificial Carlsbad Salts).

304. Sulphate of Sodium, 50 parts; Bicarbonate of Sodium, 6 parts. Dose, a teaspoonful in one or two tumblerfuls of warm water (Artificial Carlsbad Salts).

305. Macerate ½ oz. of Condurango for 12 hours with 12 oz. of Water; then boil down to 6 oz. and strain. Dose, one tablespoonful two or three times daily.

306. Opium ½ gr.; Tannic Acid, 1 gr.; White Sugar, 1 gr. To be given two or three times a day.

307. Decoction of Calumba, 5 oz.; Extract of Opium, 1 gr.; Syrup of Orange, ½ oz. One tablespoonful every two hours.

308. Cotoniæ, 1 gr.; Distilled Water, 4 oz.; Alcohol, 10 mins.; Syrup,

1 oz. One tablespoonful every hour. Five to eight drops of the Fluid Extract of Coto may be given.

309. Bromide of Sodium, 10 parts; Bromide of Ammonium, 10 parts; Distilled Water, 200 parts.

310. Potass. Citrat., 1 dr.; Spt. Ætheris Nit., 2 dr.; Tr. Opii Deodorat., 12 mins.; Syrupi, 2 dr.; Aquæ, 2 oz. One teaspoonful every two or three hours for a child five years old.—(*Meigs and Pepper.*)

311. Acid. Boracic., ½ dr.; Potass. Chlorat., 2 dr.; Tr. Ferri Chlorid., 2 dr.; Glycerinæ, 1 oz.; Syrupi, 1 oz.; Aquæ, 2 oz. One teaspoonful every two hours to a child of five years.

312. Acid. Carbolic., 1 dr.; or Acid. Boracic., 3 dr.; Liq. Potassæ, 1 dr.; Potassæ Chlorat., 2 dr.; Glycerinæ, 2 oz.; Aquæ Calcis, 8 oz. To be used as a spray "when the exudation is foul, jagged, and of a dirty-brown appearance."

313. Acidi Salicyli, 2 dr.; Bismuth. Subnit., 2 oz. Fiat pulv.

314. Olei Anisi, 1 part; Alcohol, 24 parts; Aquæ Ammoniæ, 5 parts (Liquor Ammonii Anisatus).

315. Tinct. Ferri Chloridi, 2 dr.; Potassæ Chlorat., 20 grs.; Glycerin., 1 oz.; Aquæ, 5 oz. A teaspoonful every fifteen, twenty, or thirty minutes (for a child of two years).

316. Chloroformi, 30 parts; Æthcris Sulph., 60 parts; Ol. Terebinth. Rect., 10 parts. One or two teaspoonfuls inhaled from a towel.

317. Powdered Stramonium, ½ oz.; Powdered Aniseed, 2 drs.; Powdered Nitrate of Potassium, 2 drs.; Tobacco, 5 grs.—(*Used for Asthma at the Brompton Hospital.*)

INDEX.

A.

PAGE

Abdominal bandage in typhoid 401
— pain, causes of . . . 161
Abscess of brain . . . 340
— of liver 225
Accumulators 290
Acholia 219
Acid, sulphuric, in acute nephritis 261
— — in uræmia . . . 252
— baths in hepatic disease . 218
Acidity, causes of . . . 152
— diet in . . . 153, 460
— use of alkalies in . . 153
Acids, use of, in vomiting . 157
Aconite in acute pneumonia . 115
— in cardiac disease . . 42
Acute bronchitis . . . 109
— gastric catarrh . . . 162
— nephritis, causes of . . 259
— pneumonia 113
— pyelitis 263
— rheumatism . . . 421
— tuberculosis . . . 411
Addison's disease . . . 446
Adhesions in pleurisy . . 105
Ague 426
Air, compressed, inhalation of . 86
Albuminuria, diet in . . 466
— in cardiac disease . . 63

PAGE

Alcohol in cardiac disease . 40
Alkalies as expectorants . . 89
— in rheumatism . . . 422
Alkaline sprays . . . 72
— waters in gall-stones . . 243
Alteratives 469
Alum sprays 72
Ammoniacum in bronchitis 90, 122
Ammonium carbonate in bronchitis 90, 112
— chloride in acute bronchitis 111
— — in hepatic disease . . 218
— — spray of 72
Anæmia 438
— of brain 341
— in renal disease . . . 256
— pernicious 439
Aneurism of aorta . . . 68
Angina pectoris . . 49, 67
Animal parasites . . . 205
Antacids 470
Anthelmintics 470
Antifebrin 376
Antipyretics in fever . . 375
— in pneumonia . . . 115
Antipyrin in acute tonsillitis . 141
— in fever 376
— in headache . . . 323
— in neuralgia . . . 322
Antiseptics 471

	PAGE
Antiseptics in chronic diarrhœa	185
— in gastric disease . .	157, 175
Antispasmodics . . .	471
Anuria, causes of . . .	249
— from scarlatina . . .	249
— symptoms of . . .	249
— treatment of . . .	250
Aortic regurgitation . .	66
Aphthæ	136
Apomorphia in bronchitis .	123
— in hysterical convulsions .	319
Apoplexy	336
— after treatment of . .	339
— local treatment of . .	337
— prognosis of . . .	336
— venesection in . . .	337
Appendicitis	196
Appendix, perforation of . .	212
— — diagnosis of . . .	212
— treatment of . . .	213
Appetite in gastric disease .	148
Arsenic in anæmia . . .	440
— in brain disease . . .	276
— in malaria	428
— in phthisis	126
Ascaris lumbricoides . .	207
Ascites in cirrhosis of liver .	233
Asiatic cholera . . .	419
Aspiration, bad effects of .	106
— in pneumothorax . .	108
— of pleura . . .	105, 119
Asthenic pneumonia . .	113
Asthma from hay . . .	101
— from nasal polypi . .	96
— in cardiac disease . .	62
— prevention of . . .	99
— prognosis of . . .	96
— treatment of . . .	96
Atonic dyspepsia . . .	170
— — cod-liver oil in . .	171
— — diet in . . .	170, 456
Atrophy, acute yellow . .	224
— progressive muscular . .	370
Atropine in asthma . . .	96

B.

	PAGE
Bandages to limbs in hæmatemesis	160
Barium chloride in sclerosis of brain	345
Baths, acid, in hepatic disease .	218
— in treatment of fever . .	378
— in jaundice	222
— in kidney disease . .	247
Batteries, electrical . . .	286
Beberine in malaria . .	428
Bedsores in fever . . .	386
— — treatment of . . .	386
Belladonna in biliary colic .	241
— in cardiac disease . .	66
— in exophthalmic goitre .	356
— in hooping-cough . .	415
Benzoate of sodium in chyluria	259
— in jaundice . . .	223
Biliary colic	241
Bilious diarrhœa . . .	182
— headache	324
— vomiting	158
Bismuth in gastric catarrh	149, 168
Bitters, use of, in gastric disease	148
Blisters in chronic inflammatory disease	142
— in nervous vomiting . .	157
Brain, abscess of . . .	340
— — trephining in . .	341
— anæmia of	341
— congestion of . . .	330
— — ice-bag in . . .	331
— — venesection in . .	331
— diseases of	311
— — arsenic in . . .	276
— — sedatives in . . .	275
— sclerosis of	344
— softening of . . .	343
— tumours of	345
Bright's disease, acute . .	259
— chronic	265
— diarrhœa in . . .	266
— diet in	261

PAGE

Bright's disease, dropsy in . 268
— hæmorrhage in . . . 265
— use of iron in . . . 267
— use of manganese in . . 269
— use of opium in . . . 268
— prognosis in . . . 265
Bromide of potassium in diseases of brain . . . 275
— in epilepsy 352
— in uræmia 252
Bronchiectasis . . . 120
Bronchitis, acute . . . 109
— capillary 110
— chronic 119
— compressed air in . . 87
— diet and regimen in . . 454
— fetid 122
— in cardiac disease . . 61
— kettle in laryngeal catarrh . 81
— plastic 122
Broncho-pneumonia . . 117

C.

Caffeine in cardiac disease . 41
— in kidney disease . . 247
— in salicylate poisoning . 422
Calculi, biliary, prevention of . 243
— in acute pyelitis . . . 264
— renal, prevention of . . 272
Calomel in gastric catarrh . 157
Cancer of kidney . . . 271
— of liver 237
— of stomach 172
Cannabis indica in renal disease 271
Cardiac depressants . . 46
— disease, diet and regimen in 453
— failure 46
— sedatives 472
— stimulants . . . 40, 472
— tonics 473
Cardialgia 48
Carlsbad salts in chronic dyspepsia 168

PAGE

Cascara sagrada in chronic constipation 187
Catalepsy 359
Catarrh of larynx . . . 77
— of mouth 135
— of pharynx . . . 139
Catarrhal pneumonia . . 117
Cerebral abscess . . . 340
— anæmia 341
— hæmorrhage . . . 336
— — in uræmia . . . 251
— softening 343
— thrombosis 338
— tumours 345
Cerebro-spinal fever . . 416
Cerium oxalate in gastric catarrh 149
Cestoda 206
Chalk in acute diarrhœa . . 182
Chest, pains of . . . 95
Chicken-pox 397
Chloral in brain disease . . 275
Chloroform in asthma . . 98
— in gall-stones . . . 242
Cholagogues 217
Cholera, Asiatic . . . 419
— diarrhœa of . . . 420
— transfusion in . . . 421
— uræmia in 421
Chorea 347
— arsenic in 349
— diet in 349
— local treatment in . . 348
— pyrexia in 349
— sedatives in . . . 348
— sulphocyanide of potassium in 348
Chronic Bright's disease . . 265
— hydrocephalus . . . 347
— inflammation . . . 30
— local diseases, treatment of . 30
Chyluria 259
Cirrhosis of liver . . . 232
Climates in diseases of lungs . 455

	PAGE
Cocaine in hay asthma	101
— in tubercular laryngitis	84
Cod-liver oil in dyspepsia	171
— in phthisis	125
Colchicum in acute yellow atrophy	225
— in acute gout	433
Cold applications in fever	376
— pack in delirium tremens	316
Colic, biliary	241
— vomiting in	243
— causes of	189
— prevention of	190
— treatment of	190
— renal	273
Commutator	282
Compressed air, inhalation of	87
Conium in chronic bronchitis	121
— inhalation of	70
Conjunctivitis in hay asthma	101
Constipation, causes of chronic	185
— diet in	186, 461
Convallaria	41, 63
Convulsions, causes of	317
— hysterical	357
— local treatment in	318
— sedatives in	319
— uræmic	252
— venesection in	318
Copaiba as an expectorant	90
— in renal dropsy	254
— in hepatic cirrhosis	234
Cough, causes of	94
— in acute bronchitis	111
— in children	95
— spasmodic	95
Cradle, ice, in fever	380
Cramp, writers'	372
Creasote in gastric disease	157
— inhalation of	70
Croup, false	75
— true	80
Cyanosis, causes of	91
— treatment of	92
Cystitis in fevers	387
Cystoscope in diagnosis of hæmaturia	258

D.

Delirium	312
— causes of	312
— ice cradle in	313
— restraint in	274
— sedatives in	275
— tremens	314
— — alcohol in	315
— — cold pack in	316
— — digitalis in	316
— — pulse in	314
— — sedatives in	316
Diabetes in old people	447
— insipidus	450
— — nitro-glycerine in	451
— mellitus	447
— — codeia in	448
— — diet in	449
Dial collectors	281
Diaphoretics	473
— use of, in dropsy	254
Diarrhœa, causes of	180
— acute	181
— bilious	182
— chalk in	182
— chronic	184
— — diet in	185, 462
— fermentative	182
— in hepatic disease	234
— in renal disease	268
— nervous	181
— of typhoid	400
— of uræmia	251
— spurious	184
Diet and regimen in acid dyspepsia	460
— — in atonic dyspepsia	456
— — in chronic constipation	461
— — — diarrhœa	462
— — — gout	466

PAGE

Diet and regimen in heart disease 453
— — — liver disease . . 465
— — — lung disease . . 454
— — in diabetes . . . 449
— — in obesity . . . 463
— — in renal disease . . 466
Digitalis, action of . . 41, 60, 63
— fomentations . . . 254
— in renal disease . . 247, 254
Dilated organs, treatment of . 34
Dilatation of bronchial tubes . 120
— of colon 186
— of heart 58
— of stomach 172
Diphtheria 407
— local treatment in . . 408
— of larynx 410
— of nares 408
— perchloride of iron in . . 409
— prognosis of . . . 407
— sedatives in 410
— steam inhaler in . . . 409
Diseases of brain . . . 274
— of heart 39
— of intestines . . . 177
— of kidneys 245
— of larynx 70
— of liver 217
— of lungs 86
— of mouth and throat . . 132
— of pericardium . . . 39
— of peritoneum . . . 209
— of spinal cord . . . 361
— of stomach 146
Distilled water in acute nephritis 261
Diuretics 247, 474
Dropsy in cardiac disease . 62, 65
— indications for treatment of 32
— in renal disease . . . 253
Dysentery, acute . . . 417
— — ipecacuanha in . . 417
— — quinine in . . . 418

PAGE

Dysentery, chronic . . . 419
— — enemata in . . . 419
— — irrigation in . . . 419
— scorbutic 418
Dyspepsia, atonic . . . 170
— — diet in . . . 170, 456
— causes of 170
— inflammatory . . . 168
— — diet in . . . 168, 460
Dyspeptic headache . . . 324
Dyspnœa 93
— cardiac 60

E.

Effusion, chronic pleuritic . 184
— pericardial 53
Elastic bandage in chronic constipation 186
Elaterium in renal disease . 252
Electric bath 289
Electric current, choice of . 287
— — physiological effects of . 292
— lighting currents, utilisation of 288
Electrical apparatus . . . 278
— batteries 280
— cabinet 280
— instrument makers . . 279
Electricity, application of, in disease 299
— in epilepsy 308
— in exophthalmic goitre . 309
— in hemiplegia . . . 300
— in hypochondriasis . . 308
— in hysteria 307
— in incontinence of urine . 310
— in infantile paralysis . . 301
— in injuries to nerves . . 303
— in insomnia 308
— in lead-poisoning . . 306
— in locomotor ataxia . . 308
— in lumbago 307
— in neuralgia . . . 306
— in neurasthenia . . . 308

PAGE

Electricity in neuritis . . 305
— in paralysis 300
— in progressive muscular atrophy 308
— in Raynaud's disease . . 309
— in sciatica 307
— in treatment of disease . 278
— in writers' cramp . . 308
— testing of muscles by . . 296
— value of, in diagnosis . . 297
Electrodes 284
Electrolytic effects of current . 294
Embolism in endocarditis . 55
Emesis 156
Emetics in acute gastric catarrh 162
— in bronchitis . . . 118
— in croup 80
Emphysema 123
— asthma in 123
— use of rarefied air in . 88
Empyema . . . 102, 107
Endocarditis, prognosis of . 54
— treatment of . . . 55
— ulcerative 56
Enemata 179
— cold, in jaundice . . 221
— in chronic constipation . 188
— nutrient 146
— — of Leube . . . 147
Enteric fever, antipyretic treatment of 399
— constipation in . . . 400
— diarrhœa in . . . 400
— diet in 398
— hæmorrhage in . . . 401
— in malaria 428
— perforation in . . . 401
— prognosis of . . . 397
— quinine in 399
— sedatives in . . . 401
— stimulants in . . . 399
— use of abdominal bandage in 401
Epilepsy 351
— digitalis in 352

PAGE

Epilepsy, sedatives in . . 352
Ergot in angina pectoris . . 67
Erysipelas 405
— iron in 406
— œdema of glottis in . . 406
Exercise in chronic constipation 186
Exophthalmic goitre . . 356
— local treatment of . . 356
Expectorant remedies . 89, 475
Expectoration, indications afforded by 121
— varieties of 121

F.

Facial neuralgia . . . 325
Fæcal accumulation . 200, 201
Fainting fits 46
Fayrer on treatment of hepatic abscess. 227
Fermentation in stomach 157, 175
Fetid bronchitis . . . 122
Fever 374
— antipyretics in . . . 375
— cerebro-spinal . . . 416
— cold bath in . . . 378
— dangers of 380
— diaphoretics in . . . 375
— ice-cradle in . . . 380
— pack in 377
— sponging in . . . 376
— venesection in . . . 375
Fevers, infectious . . . 384
Fish, relative digestibility of . 147
Flatulence, causes of . . 153
— charcoal in 154
— diet in 154
— treatment of . . . 154
Foods, relative digestibility of . 147
Formulæ 469
Frerich's theory of uræmia . 252
Fruits, digestibility of . . 148

G.

Gall-stones 241
— alkalies in 241

	PAGE
Gall-stones, belladonna in	241
— opium in	241
— prevention of	243
— prognosis of	241
Gall-bladder, operations on	243
Galvanism in chronic constipation	185
— in dilatation of stomach	175
— in exophthalmic goitre	309
— in gastralgia	162
— in laryngeal disease	74
— in nervous disease	299
Galvanometer	282
Gamboge in renal disease	255
Gangrene of lung	116
Gangrenous stomatitis	137
Gastralgia	161
Gastric catarrh, acute	162
— — vomiting of	157
— secretion, stimulants of	148
— ulcer	164
— — diet in	165
Glottis, œdema of	79, 253
Gonorrhœal rheumatism	424
Gout, acute	433
— — colchicum in	433
— — local applications in	434
— chronic	435
— — diet in	434, 466
— — spasmodic cough of	95
— irregular	432
Graves' disease	356
Guaiacum in acute rheumatism	423
— in acute tonsillitis	141
Gum-resins in chronic bronchitis	121

H.

	PAGE
Hæmatemesis	159
— in hepatic cirrhosis	232
Hæmaturia	257
Hæmoglobinuria	257
— arsenic in	257
Hæmoptysis	128
Hæmoptysis, chronic	129
— — diet in	130
— — ergotine in	129
— in cardiac disease	61, 128
— inhalations in	130
Hæmorrhage, cerebral	336
— in Bright's disease	265
— in hepatic disease	232
— in jaundice	223
— indications for treatment of	24
— intestinal	192
— in typhoid	401
— spinal	361
Hamamelis in melæna	193
Hay asthma	101
Head, pains in	323
— — antipyrin for	323
— — cannabis indica for	324
— — phenacetin for	323
Heart, acute diseases of	51
— dilatation of	58
— diseases of	39
— failure of	47
— hypertrophy of	57
Hepatic congestion	229
— diseases (see *Liver*)	217
— neuralgia	223
Herniæ as cause of constipation	186
Herpes zoster as cause of pleurodynia	96
Hiccough	161
Himrod's powder in asthma	96
Hodgkin's disease	446
Hooping-cough	414
— sedatives in	415
Hot-air bath in renal disease	246
Hydrocephalus	347
Hydronephrosis	270
Hydrophobia	353
— Pasteur's treatment of	354
— sedatives in	354
Hydrothorax	119
Hyoscine in delirium	277
Hypersecretio acida	152

PAGE

Hypophosphites in emphysema 124
Hysteria 357
— convulsions in . . . 358
— sedatives in . . . 358
— turpentine in . . . 320
— Weir-Mitchell treatment of 359

I.

Ice-bag in acute peritonitis . 210
— in aneurism . . . 69
— in cardiac disease . . 52
— in congestion of brain . 331
— in delirium 313
— in intestinal hæmorrhage . 192
— in laryngeal catarrh . . 79
— in palpitation . . . 44
— in pneumonia . . . 115
Ice-cradle, advantages of . 383
— disadvantages of . . . 384
— in pneumonia . . . 384
— in treatment of fever . . 380
— in typhoid fever . . . 398
Icterus 220
Induction coils . . . 283
Infantile paralysis . . . 369
Infectious fevers . . . 384
— bedsores in 386
— cystitis in 386
Inflammation of œsophagus . 143
— treatment of acute . . 16
— — of chronic . . . 30
Influenza 413
Inhalations in laryngeal disease 71
Insomnia in brain disease . 275
— in cardiac disease . . 62
— in fever 401
Intestinal catarrh, acute . . 193
— — chronic 204
— hæmorrhage . . 192, 401
— neuralgia 189
— obstruction . . . 198
— — opium in . . . 202
— — prognosis of . . . 200

PAGE

Intestinal parasites . . . 205
Intestines, diseases of . . 177
— — purgatives in . . . 178
— functional disease of . . 180
Intussusception . . . 201
— treatment of . . . 201
Iodide of potassium in syphilis 431
Iodine inhalation . . . 71
Ipecacuanha in dysentery . 417
Iron in anæmia . . . 440
— in diphtheria . . . 409
— in dyspepsia . . . 148
— in pneumonia . . . 116
— in renal disease . . . 256
Irritable skin in jaundice . 222

J.

Jaborandi in intestinal catarrh 193, 196
— in uræmia 251
Jaundice 220
— cold enemata in . . . 221
— diet in 222
— hæmorrhage in . . 220, 223
— hepatic stimulants in . . 222
— prognosis of . . . 220
Juniper in renal disease . . 248

K.

Kidney, acute inflammation of 259
— calculi of 272
— cancer of 271
— chronic inflammation of . 265
— diseases of 245
— — hot-air bath in . . 246
— — diet and regimen in . 466
— — injuries to skin in . . 255
— sarcoma of 271
— — acids in 271
— — sedatives in . . . 271

L.

	PAGE
Lardaceous disease of liver	239
Laryngismus stridulus	75
Laryngitis, acute	77
— chronic	83
— — prevention of	83
— membranous	80
— syphilitic	84
— tubercular	84
Larynx, diseases of	70
— galvanisation of	74
— local applications to	70
Leeches in acute pleurisy	103
— in children's diseases	112
— in gastric disease	163, 164
Leiter's tubes	79
Leube's nutrient enemata	147
— solution of beef	146
— stomach-pump	149
Leucocythæmia	445
Liniments in acute bronchitis	111
Liquorice in nephritis	247
Liver, abscess of	225
— — diet in	228
— — ipecacuanha in	227
— — mercury in	227
— — prognosis of	226
— — puncture in	228
— — sedatives in	227
— — surgical treatment of	227
— — varieties of	225
— acid baths in diseases of	218
— acute atrophy of	224
— cancer of	237
— cirrhosis of	232
— — ascites in	233
— — copaiba in	234
— — diarrhœa in	234
— — hæmatemesis in	232
— — perihepatitis in	233
— — purgatives in	233
— — use of mercury in	233
— congestion of	229
— — chronic	231
Liver, congestion of, diet in	231
— disease, diet and regimen in	465
— drugs in diseases of	217
— fatty	238
— — diet in	238
— hydatid of	235
— lardaceous	239
— mineral waters in diseases of	218
— neuralgia of	223
Locomotor ataxia	367
Lung, acute congestion of	61
— diseases of	86
— gangrene of	116
— œdema of	60
Lymphadenoma	446

M.

	PAGE
Malarial fever	426
— — arsenic in	428
— — beberine in	428
— — emetics in	427
— — enlarged spleen in	428
— — eucalyptus in	428
— — quinine in	427
— — Warburg's tincture in	428
Malarial neuralgia	321, 428
Manganese phosphate, uses of	256, 269
Mangrove bark in chyluria	259
Mastication, importance of	148
Measles	388
— complications of	389
— convulsions in	388
— German	390
Melæna	192
Meningitis, cerebral	331
— — local treatment of	332
— — mercury in	332
— — sedatives in	333
— tubercular	334
— — diet in	335
— — local treatment of	335

PAGE

Meningitis, tubercular, sedatives in 335
— spinal, acute . . . 362
— — chronic 364
Mercury in cardiac disease . 61
— in croup 80
— in hepatic cirrhosis . . 233
— in meningitis . . . 332
— in syphilis 429
Metallic tremors . . . 373
Mineral waters in chronic constipation 187
— — in hepatic congestion . 230
Morphia in uræmia . . . 252
Mouth, diseases of . . . 131
— washes 135
Multiple neuritis . . . 366
— — galvanism in . . . 305
— — sedatives in . . . 366
Murmurs, cardiac . . . 65
Muscles, electrical testing of . 296
Myelitis, acute . . . 363
— — local treatment of . . 363
— chronic 365
Myxœdema 451

N.

Nematode worms . . . 207
Nephritis, acute . . . 259
— citrate of potash in . . 261
— diet in 261
— distilled water in . . 261
— hot-air bath in . . . 261
— iron in 260
— pilocarpine in . . . 261
— sulphuric acid in . . 261
— use of cathartics in . . 261
— venesection in . . . 260
Nerve and muscle phenomena . 295
Nervine excito-motors . . 474
— sedatives 471
— stimulants 275
— tonics 480

PAGE

Neuralgia 320
— antipyrin in . . . 322
— facial 325
— gastric 161
— hepatic 223
— intestinal 189
— malarial 321
— predisposing causes of . 321
— prevention of . . . 36
— sedatives in . . . 322
— supra-orbital . . . 428
— — indications for treatment of 27
Neuralgic headache . . . 323
Neuritis, multiple . . . 366
Night-sweats in phthisis . . 131
Nitrite of amyl in angina . 50
— in asthma 97
Nitro-glycerine in angina . 50
Nitro-hydrochloric acid in jaundice 222
Noma 137
Nutrient enemata . . . 146

O.

Obesity, diet and regimen in . 463
Obstruction, intestinal . . 198
Œdema in cardiac disease . 64
— in kidney disease . . 253
— of glottis 79
Œsophagus, inflammation of . 143
— stricture of . . . 145
Œsophageal bougies . . 145
Opium, contra-indications for use of 112, 277
— use of, in Bright's disease . 268
— — in bronchitis . . 112, 121
— — in gastric ulcer . . 164
— — in peritonitis . . . 211
— — in pleurisy . . . 103
— — in typhlitis . . . 107
Oral catarrh 135
Oxyuris vermicularis . . 208

P.

PAGE

Pack, cold, in pneumonia . 115
Pains in the chest . . . 95
— in the head. . . . 323
Palpitation, causes of . . 43
— prevention of . . . 44
— treatment of . . . 43
Paracentesis abdominis . . 234
— pericardii 53
— thoracis 105
Paraldehyde 344
Paralysis agitans . . . 371
— alcoholic 366
— causes of 327
— infantile 369
— lead 327
— of vocal cords . . . 76
— treatment of . . . 328
Paraplegia 363
Parasites in intestine . . 205
Parotitis 412
Pepsine in gastric disease . 149
Perforation of the appendix vermiformis. . . . 212
Pericardial effusion . . . 53
Pericarditis, acute . . . 51
— chronic 53
Pericardium, diseases of . . 54
Peritoneum, cancer of . . 215
— diseases of 209
Peritonitis, acute . . . 204
— — diagnosis of . . . 212
— — diet in 211
— — effusion in . . . 211
— — from perforated appendix 212
— — opium in . . 211, 214
— — treatment of . . . 210
— chronic 214
Perityphlitis 212
Perspirations in phthisis . . 131
Pertussis. 415
Pharynx, acute catarrh of . 139
— chronic catarrh of . . 140

PAGE

Pharynx, phlegmonous inflammation of 141
Phenacetin in fever. . . . 375
— in neuralgia . . . 322
— in uræmic headache . . 252
Phosphate of sodium in gall-stones 243
— in hepatic congestion . . 230
Phthisis, antipyretics in . . 126
— arsenic in 126
— cod-liver oil in . . . 125
— cough in 127
— creasote in 127
— diet in 125
— digestion in . . . 126
— inhalations in . . . 127
— morphine in . . . 127
— night-sweats in . . . 131
— prognosis in . . . 124
— pulmonalis 124
— tonics in 126
Pilocarpine in acute nephritis . 261
— in uræmia 253
Pleura, aspiration of . . 105
Pleurisy 102
— effusion in 104
— strapping in . . . 104
Pneumonia, acute . . . 113
— catarrhal 117
Pneumothorax . . . 108
Podophyllin in headache . . 324
Potassium citrate in gravel . 272
— in nephritis . . . 261
Progressive muscular atrophy . 370
Purgatives . . . 177, 476
— in cardiac disease . . 64
— in gastric ulcer . . . 165
— in renal dropsy . . . 247
— in uræmia 252
Purpura, causes of . . . 444
— treatment of . . . 445
Pyæmia 411
Pyelitis, acute 263
— — calculi in . . . 264

PAGE

Pyelitis, acute, local treatment of 264
— chronic 269
— — sandal-wood oil in . . 270
— — turpentine in . . . 270
Pyelo-nephritis . . . 262
Pyonephrosis 269
Pyrosis 155

Q.

Quinine in dysentery . . 418
— in enteric fever . . . 399
— in fevers 376
— in malaria 427
— in neuralgia . . . 323

R.

Rabies 353
Reaction of degeneration . 298
Relapsing fever . . . 464
Renal calculi 272
— — diet in 272
— — prevention of . . 272
— colic 273
— — local application in . 273
— — morphia in . . . 273
— disease (see *Kidney*) . . 245
Resistance of body to electric current 293
Respiration, artificial . . 82
Respirators in disease of larynx 73
Retro-pharyngeal abscess . 143
Rheumatic arthritis . . 441
— headache 324
— tonsillitis 141
Rheumatism, acute . . . 421
— alkalies in 422
— gonorrhœal . . . 424
— hyperpyrexia in . . . 423
— lemon juice in . . . 423
— local applications in . . 423
— salicylates in . . . 422
— subacute 424

PAGE

Rickets 443
Rötheln 390
Round-worms 207

S.

Salicylate of sodium in acute rheumatism . . . 422
Salicylic acid in rheumatism . 424
Salivation 138
Sandal-wood oil in pyelitis . 270
Santonine, administration of . 207
Scarlatina 391
— complications of . . . 393
— uræmic convulsions in . 393
Sciatica 326
Selerosis of brain . . . 344
Scurvy 437
Sedatives 478
Serous membranes, secondary inflammation of . . 251, 252
Siegle's spray 72
Silver nitrate in gastric catarrh 149, 169
— in pyrosis 155
— in tabes dorsalis . . . 368
— spray of 72
Skin, itching of, in jaundice . 222
Smallpox 394
— complications of . . . 396
— scars in, prevention of . 396
Sodium benzoate in jaundice . 223
— phosphate in gall-stones . 243
Softening of brain . . . 343
Southey's tubes in dropsy . 256
Spasms, indications for treatment of 27
— prevention of . . . 36
Spastic paraplegia . . . 369
Spinal cord, congestion of . 361
— — diseases of . . . 361
— — hæmorrhage into . . 361
— meningitis 362
Sponging in fever . . . 376

PAGE

Sprays in diseases of larynx . 72
Squills in bronchitis . . 90
— in renal disease . . . 247
Status epilepticus . . . 352
Stimulants, cardiac . . 40, 472
Stomach, diseases of . . 146
— cancer of 172
— — condurango in . . 173
— — sedatives in . . . 173
— catarrh of 162
— dilatation of . . . 173
— — vomiting in . . . 174
— irritability of . . . 149
— neuralgia of . . . 161
— ulcer of 164
Stomach-pump, indications for 149, 152
— in cancer 173
— in chronic gastric catarrh 149, 158
— in dilatation of stomach . 174
— in gastric ulcer . . . 165
Stomatitis 136
Strophanthus . . . 41, 63
Strychnia, intra-muscular use of 339
Sulphuric acid, use of, in renal disease 261
Suppositories, use of . . 146
Supra-renal disease . . 446
Syncope, causes of . . . 46
— treatment of . . . 46
Syphilis 428
— calomel baths in . . 430
— mercury in 429
— iodide of potassium in . 431
Syphilitic headache . . 324

T.

Tabes dorsalis 367
— — vomiting in . . . 368
Tapeworms 206

PAGE

Tartar emetic in acute bronchitis 111
— — in cardiac disease . . 42
Tartrate of potassium in renal disease 255
Tetanus 354
Threadworms 208
Throat, diseases of . . . 132
Thrombosis, cerebral . . 338
Thrush 133
Thyroid juice in myxœdema . 451
Tobacco in chronic constipation 186
Tobacco in colic . . . 190
Tongue as indication of disease 132
— morbid states of . . . 132
Tonics 479
Tonsillitis 141
Tracheotomy for laryngitis . 79
— for membranous laryngitis . 81
Transformer, electrical . . 289
Transfusion in cholera . . 421
Tremors, metallic . . . 372
Tubercular meningitis . . 334
Tuberculosis, acute . . . 411
— arsenic in 412
Tumours of brain . . . 345
Turpentine in hysteria . . 320
— in nematode worms . . 207
— in pyelitis 270
— in renal colic . . . 273
Typhlitis 196
— diet in 197
— opium in 197
Typhoid fever (see *Enteric*) . 397
Typhus 403

U.

Ulcer of stomach . . . 164
Uræmia 250
— convulsions in . . . 250
— headache in . . . 250

	PAGE
Uræmia, inflammation of serous membranes in	251
— morphine in	252
— neuralgia in	252
— pilocarpine in	251
— prognosis of	251
— purgatives in	252
— sulphuric acid in	252
— symptoms of	250
— venesection in	251
Urine, necessity for examination of	248
Uvula as cause of cough	94

V.

Valvular disease	65
Vapour-baths in renal disease	246
Varicella	397
Variola	394
Vegetables, digestibility of	148
Venesection in acute pneumonia	114
— in aneurism	68
— in cardiac disease	62
— in cerebral hæmorrhage	337
— in congestion of brain	331
— in convulsions	318
— in cyanosis	92
— in pneumothorax	108
— in uræmia	251
Veratrum viride in cardiac disease	46
Vomiting, bilious	158
— causes of	156
— hysterical	156
— in acute yellow atrophy	224
— in biliary colic	243
— in Bright's disease	266
— in dilatation of stomach	175
— in gastric catarrh	158, 162, 169
— in meningitis	332
— in phthisis	157
— sedatives in reflex	156

W.

Waldenburg's apparatus for compressed air	87
Warburg's tincture	428
Washing out of stomach	149
Water-brash	155
Water, distilled, in renal disease	261
Weir-Mitchell on hysteria	359
West on treatment of noma	137
Wet cloths in pyrexia	378
— pack in fever	377
— — in acute pneumonia	115
Winter-green oil in gout	434
— in rheumatism	422
Writers' cramp	372

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——— on Diseases of Women, 3
Bateman's Aphasia, 7
Beale on Liver, 6
——— Microscope in Medicine, 6
——— Slight Ailments, 6
——— Urinary and Renal Derangements, 12
Beasley's Book of Prescriptions, 4
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——— Pocket Formulary, 4
Bellamy's Surgical Anatomy, 1
Bentley and Trimen's Medicinal Plants, 5
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——— Systematic Botany, 5
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Bloxam's Chemistry, 12
——— Laboratory Teaching, 12
Bousfield's Photo-Micrography, 14
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Bowman and Bloxam's Practical Chemistry, 13
Brodhurst's Anchylosis, 9
——— Curvatures, &c., of the Spine, 9
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Clowes' Practical Chemistry, 12
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Cooper and Edwards' Diseases of the Rectum, 12
Cripps' (H.) Cancer of the Rectum, 12
——— Diseases of the Rectum and Anus, 12
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——— Short Manual for Monthly Nurses, 4
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——— Short Contributions, 10
Day on Diseases of Children, 4
—— on Headaches, 8
Domville's Manual for Nurses, 3
Doran's Gynæcological Operations, 3
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Ellis's (E.) Diseases of Children, 4
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Fagge's Principles and Practice of Medicine, 5
Fayrer's Climate and Fevers of India, 5
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Fenwick's (S.) Medical Diagnosis, 6
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——— Outlines of Medical Treatment, 6
——— The Saliva as a Test, 6
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———— Illustrations of Skin Diseases, 11
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———— Methods and Formulæ, 14
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Thin's Cancerous Affections of the Skin, 11
——— Pathology and Treatment of Ringworm, 11
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Thompson's (Sir H.) Calculous Disease, 11
———— Diseases of the Prostate, 11
———— Diseases of the Urinary Organs, 11
———— Introduction to Catalogue, 11
———— Lithotomy and Lithotrity, 11
———— Stricture of the Urethra, 11
———— Suprapubic Operation, 11
———— Surgery of the Urinary Organs, 11
———— Tumours of the Bladder, 11
Tirard's Prescriber's Pharmacopœia, 5
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Tommasi-Crudelli's Climate of Rome, 6
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Treves and Lang's German-English Dictionary, 12
Tuke's Dictionary of Psychological Medicine, 3
——— Influence of the Mind upon the Body, 3
——— Prichard and Symonds and Mental Science, 3
——— Reform in the Treatment of the Insane, 3
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